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Charles Sanders Peirce and the Pike County Historical Society.

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LA PHILOSOPHIE EN FRANCE

1942-1945

DEPUIS la dernière correspondance sur *La philosophie en France* publiée dans le numéro de Janvier 1942, la difficulté de communiquer avec les États-Unis ne m'a pas permis d'envoyer aux dates habituelles un compte-rendu des publications et des mouvements d'idées qui ont continué à se produire dans notre malheureux pays. Tout était obstacle à la vie intellectuelle : l'occupation, d'abord partielle, puis totale ; l'absence de tant de prisonniers et de déportés ; l'insécurité quotidienne où vivaient ceux qui étaient obligés de se cacher pour échapper à l'ennemi ; pour tous, l'absence de chauffage en hiver, et la disparition de toutes les ressources nécessaires, épuisées par les réquisitions allemandes. Les bombardements, les destructions de toute sorte, la difficulté des communications s'ajoutaient à cette pénurie. Eh bien, malgré tout cela, le travail philosophique n'a pas cessé, des livres ont pu paraître ; et même, les effets survivant aux causes, et continuant à s'aggraver, c'est surtout depuis notre libération et depuis la déroute allemande que la situation est la plus mauvaise : les imprimeries sont durement éprouvées, à l'heure où j'écris, faute de papier, de métal pour fondre les caractères, et de gaz pour cette fonte ; en même temps, l'insuffisance persistante de l'alimentation et le manque de vêtements continuent à peser sur la vie des travailleurs, intellectuels comme manuels.[1] C'est ainsi que le *Vocabulaire technique et critique* de la "Société française de philosophie", pour ne

[1] On remarquera d'ailleurs que les années 1942 et 1943 sont celles qui ont fourni de beaucoup le plus grand nombre des ouvrages cités dans le présent article.

prendre que cet exemple, est épuisé depuis deux ans, et que la cinquième édition, refondue et augmentée, dont le manuscrit était prêt en juin 1943, attend encore ses premières épreuves. L'aide généreuse des États-Unis commence à améliorer cette situation, et je tiens à dire avant tout aux lecteurs américains combien les philosophes français leur en ont de reconnaissance. Mais la disparition des ressources matérielles et l'affaiblissement des forces vitales sont si profonds qu'il faudra bien des mois encore, sinon des années, pour revenir à un état normal.

De nombreux vides, pendant cette période, se sont produits parmi nous. Je ne puis nommer ici tous les disparus qui étaient estimés dans les milieux philosophiques français; parmi ceux dont le nom était bien connu à l'étranger, nous avons perdu—je les énumère par rang d'âge: Jules de Gaultier, Victor Basch, Léon Brunschvicg, André Darbon, Emmanuel Leroux. Le présent article devant être aussi bref que possible, en raison de la longue période qu'il concerne, il faut renoncer à résumer ici leur carrière: on la trouvera rappelée dans les Revues philosophiques françaises. La *Revue de Métaphysique et de Morale* a notamment consacré un numéro entier à la mémoire de Léon Brunschvicg, l'un de ses fondateurs.

Nous laisserons de côté, pour la même raison, les travaux sur l'histoire de la philosophie, en nous bornant à mentionner les titres des plus importants: deux ouvrages magistraux de M. Léon Robin, l'un sur *Pyrrhon et le scepticisme grec*,[2] l'autre sur *Aristote*;[3] *Descartes et Pascal lecteurs de Montaigne*[4] par Léon Brunschvicg; *Mersenne, ou la naissance du mécanisme*,[5] par M. Robert Lenoble; *Une vie avec Blaise Pascal*,[6] par M. Z. Tourneur, ouvrage très curieux à divers points de vue, et surtout en ce que la connaissance longue et appro-

[2] Pp. 257, "Les Presses Universitaires", 1944.
[3] Pp. 324, *Ibid.*, 1945. M. Léon Robin a aussi achevé sa précieuse traduction des oeuvres complètes de Platon en 2 vol. de xix, 1380 et 1597 pages, Bibliothèque de la Pléiade, Gallimard, 1940 et 1942.
[4] Pp. 210, Éditions de La Baconnière (Suisse), 1942.
[5] Pp. lxiii, 633, Vrin, 1943. M. L'abbé Lenoble est aussi l'auteur d'une thèse très personnelle et très dense, *Essai sur la notion d'expérience* (pp. 287 en petits caractères; Vrin, 1943). Elle traite pour une part de l'expérience externe, mais surtout de l'expérience intérieure, et s'élève par elle jusqu'à de hautes conclusions métaphysiques et morales.
[6] Pp. 165, Vrin, 1943.

fondie que l'auteur a de Pascal n'a pas abouti chez lui, comme d'ordinaire, à une dévote admiration; *Le rôle de l'imagination dans la connaissance chez Kant,*[7] par M. Edgar Wolff; et deux études remarquables de M. Verneaux, l'une sur *Renouvier disciple et critique de Kant,*[8] l'autre sur *L'idéalisme de Renouvier.*[9] *La philosophie de Claude Bernard,*[10] par le R. P. Sertillanges, montre la ressemblance étroite de cette philosophie et des idées thomistes sur la vie. Enfin, aux limites de l'histoire et de la philosophie, un recueil d'articles lucides et vigoureux de M. Henri Gouhier, le savant historien d'Auguste Comte, *La philosophie et son histoire*[11] le second de ces essais, écrit en 1942, était encore inédit; il est particulièrement riche de réflexions originales sur l'"historique" et l'"actuel".

I

On peut distinguer en philosophie, deux sortes de travaux: les uns, analogues aux travaux scientifiques, ont un caractère de progrès collectivement reconnaissable. Assurément, ils sont l'oeuvre de tel ou tel homme; ils peuvent contenir, comme les ouvrages de science, des erreurs qui seront corrigées, et des approximations qui seront précisées: mais ils aboutissent à constituer un acquis, dont ceux qui viennent ensuite doivent prendre connaissance, sous peine de retomber dans des confusions dépassées, ou de redécouvrir ce qui était déjà connu.—Les autres ont un caractère plus individuel, et moins coopératif: c'est le domaine des vues générales sur le monde, qui expriment surtout le tempérament de leurs auteurs; c'est aussi quelquefois le domaine de certaines modes, analogues aux modes littéraires, et qui passent comme elles avec le temps. Certainement, il y a bien des ouvrages où s'unissent à des degrés divers ces deux sortes de philosophie; mais au fond, elles restent distinctes, du moins par l'attitude intellectuelle de l'auteur, et suivant sa conception de la réalité. "Les vrais désaccords entre les philosophes", disait M. Gouhier dans l'ouvrage que nous citions un peu plus haut, "sont antérieurs à leurs philosophies".

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[7] Pp. 192, Imprimerie Bonnafous, Carcassonne.
[8] Pp. 135, Vrin, 1945.
[9] Pp. 346, Vrin, 1943.
[10] Pp. 256, Aubier, 1943.
[11] Pp. 139, Vrin, 1944.

La première tendance s'exprime d'abord dans les recherches de psychologie philosophique. Elle est dominante dans les études conduites suivant la méthode de M. Paul Guillaume, principal représentant en France de la "psychologie de réaction", c'est-à-dire du behaviorisme, au sens méthodologique, et non métaphysique de ce mot. Son *Introduction à la Psychologie*[12] est la justification théorique d'une pratique déjà longue: ouvrage capital, riche d'idées, novateur dans son fond, sévère même pour la psychologie telle qu'elle est pratiquée et enseignée le plus souvent, mais tout à fait classique, au meilleur sens de ce mot, par l'ordre et la clarté de l'exposition, en même temps que très nuancé dans ses discussions et ses jugements. Il ne semble pas qu'il ait jamais paru en France d'étude plus vigoureuse sur la méthode de la psychologie.

Mais sans prétendre moins expressément à l'objectivité—je veux dire à la production et à l'expression de vérités valables pour n'importe quelle pensée rationnelle—les psychologues accordent généralement davantage à l'analyse de ce qui est senti par la conscience, et qui se communique aux autres par le langage. Une oeuvre de grande portée à cet égard, et qu'il y a lieu de mentionner, bien qu'elle doive comporter deux parties dont la première seule a paru, est le *Traité de Psychologie générale* de M. Maurice Pradines.[13] A la méthode expérimentale il préfère la méthode génétique, plus hasardée, mais qui donne aussi plus de liberté à la recherche: il possède d'ailleurs une lecture extrêmement étendue en français, en anglais, en allemand; des bibliographies d'une grande richesse accompagnent et appuient chacun de ses chapitres. N'en concluez pas que l'ouvrage n'est qu'un répertoire des observations et des opinions d'autrui. Loin de là: l'auteur a des idées personnelles, originales et décidées, qu'il soutient avec beaucoup de force et d'abondance. Mais il sera mieux d'attendre, pour les exposer, que le second volume ait paru.

D'autres œuvres, plus spéciales, ont marqué dans ce domaine. Deux

[12] Pp. 380, Vrin, 1942. M. Paul Guillaume, Professeur à la Sorbonne, dirige chez le même éditeur une collection, "Études de psychologie et de philosophie", dans laquelle a paru récemment *Le behaviorisme, origine et développement de la psychologie de réaction en Amérique* (pp. 531), par un savant expérimentateur, mort prématurément, cette année même, M. André Tilquin.

[13] Tome I: "Les fonctions élémentaires". Pp. xxxii, 747, "Les Presses Universitaires", 1943.

d'entre elles touchent à la fois à la psychologie et à la logique: *Classes, relations et nombres,*[14] par M. Jean Piaget (de Genève), est une étude très originale, très technique sous ses deux aspects: l'auteur, s'appuyant sur les résultats de ses célèbres recherches de psychologie des enfants, éclaire par l'analyse génétique des notions leur systématisation logistique.—*L'Idée de Nécessité,*[15] par M. Jean Laporte, Professeur à la Sorbonne, est un livre solidement informé au point de vue psychologique comme au point de vue logique, lucide et substantiel. Il est écrit dans une excellente langue, ce qui n'est pas toujours le cas des ouvrages philosophiques actuels: il lui arrive même de traduire élégamment, en langage simple et clair, telle ou telle phrase hermétique d'un auteur dont il parle. Mais surtout la discussion est chez lui d'une remarquable liberté d'esprit, pleine de force, de vivacité, et souvent d'humour. Les conclusions paraissent d'abord bien négatives: pour lui comme pour Hume, il n'y a point de nécessité absolue, ni physique, ni mathématique, ni logique, ni même rationnelle; ce qui en approche le plus est la présence d'un fait actuel, ou la fidélité aux conventions acceptées. Mais ce n'est pas à dire qu'il conclue en sceptique: transposant la question de l'ordre des faits à celui des valeurs, il voit dans l'idée de *nécessité* la marque que la science humaine éprouve le besoin d'un absolu qu'elle n'atteint pas; elle est le symbole de "ce désir profond et insatisfait que nous avons, dans l'ordre de la connaissance comme dans les autres, d'un *au-delà*".

Le Caractère,[16] par M. Albert Burloud, est également une œuvre brève, mais personnelle et approfondie, elle aussi, qui complète et applique les recherches hautement estimées de l'auteur sur la psychologie des tendances.—M. Bachelard, quoique savant spécialiste en matière d'épistémologie, et de qui nous avons souvent parlé à ce sujet, a fait paraître récemment deux volumes semi-littéraires, mais d'un grand intérêt pour le philosophe: *L'eau et les rêves, essai sur l'imagination de la matière;*[17] *L'air et les songes, essai sur l'imagination du mouvement.*[18]—*La structure du comportement,*[19] par M. Mer-

[14] Pp. 323, J. Vrin, 1942.
[15] Pp. 157, "Les Presses Universitaires", 1941. (Publié en 1942.)
[16] Pp. 167, "Les Presses Universitaires", 1942.
[17] Pp. 267, José Corti, 1942.
[18] Pp. 307, José Corti, 1943. Ces ouvrages font suite à la *Psychanalyse du feu,* du même auteur.
[19] Pp. 314, "Les Presses Universitaires", 1942.

leau-Ponty, analyse avec originalité, et dans un langage très moderne, mais souvent difficile, le réflexe, l'habitude, la volonté, et tire de ces analyses des conclusions monistiques en ce qui concerne les rapports de l'esprit et du corps. Mentionnons enfin une étude souvent discutable, mais très fouillée, pleine de documents utiles et de réflexions personnelles, *La sensation et l'image*,[20] écrite par M. Edgar Wolff, pendant la persécution allemande contre les Juifs, et péniblement imprimée dans une petite ville où il avait dû se réfugier. L'épigraphe mérite d'être rappelée: "Hodie, primum philosophari, deinde vivere—aut fortasse mori."

Les ouvrages de Logique et d'Épistémologie[21] continuent à représenter une part importante de la production philosophique française. Une nouvelle *Logique*,[22] de M. Paul Mouy, dont on connaît les solides travaux d'histoire des sciences, inaugure un "Cours de philosophie" qui sera rédigé par divers auteurs sous la direction de M. Georges Davy, Correspondant de l'Institut, ancien Inspecteur général de l'Instruction publique, et maintenant Professeur à la Sorbonne. Cet ouvrage est, en principe, destiné aux classes de "Philosophie" et de "Mathématiques", par lesquelles se terminent en France, au choix des élèves, ce qu'on nomme "enseignement secondaire".[23] C'est le cours d'études que suivent tous les jeunes gens ou jeunes filles, de onze à dix-huit ans environ, quand ils se destinent à des carrières libérales: Sciences, Lettres, Droit, Médecine, Administration; et aussi un grand nombre de ceux qui se destinent au commerce ou à l'industrie, ou simplement à qui leurs familles, sans projet spécial de carrière, veulent assurer une éducation développée. Ceux qui optent pour la classe "Philosophie" reçoivent un enseignement complet de Psychologie, Logique, Morale, Esthétique (facultative) et Philosophie générale. Ceux qui optent pour les "Mathématiques" n'en reçoivent qu'une partie: Logique et Morale. Mais on voit quelle diffusion cela

[20] Pp. 499, Carcassonne, Imprimerie Bonnafous, 1942.
[21] Au sens français de ce mot: Méthodologie et Philosophie des sciences.
[22] *Logique et Philosophie des Sciences*. Pp. 250, Hachette, 1944. Mais utiliser de préférence la deuxième édition, en ce moment sous presse, où ont été revisés et améliorés certains passages.
[23] Ou: "enseignement du second degré". Cet enseignement, qui comprend sept années d'études, est donné gratuitement dans les Lycées et Collèges de l'État.

donne, en France, aux connaissances philosophiques élémentaires.

L'ouvrage de M. Mouy ne se borne pas au niveau moyen de cet enseignement, mais il en prend pour cadre le programme, en le développant dans le sens des idées nouvelles sur les sciences et en particulier sur la nouvelle Physique Mathématique: la "Relativité", restreinte et généralisée, la Mécanique ondulatoire, les théories sur la structure des atomes, sur les quanta, sur la discontinuité, sur l'indétermination, ou plus exactement, dit l'auteur, sur le caractère incertain, indéterminable expérimentalement de certaines relations élémentaires, relatives aux électrons considérés individuellement. Il va de soi qu'il traite également des questions plus anciennes et plus classiques sur les méthodes en biologie, en psychologie, en sociologie, dans les sciences normatives, et naturellement aussi des procédés généraux de l'esprit dans la formation des concepts, dans le jugement et le raisonnement.

J'ai parlé d'abord de cet ouvrage en raison de sa généralité; mais l'activité est grande, sous des formes variées, dans tout le domaine de la critique et de la philosophie des sciences. Elle a été stimulée par le mouvement qu'on pourrait appeler "l'orthogénèse de la physique moderne". Avec Bacon et Descartes, la physique avait entrepris d'expliquer les phénomènes sensibles en les ramenant aux *schematismi latentes, processus latentes,* comme disait l'auteur du *Novum Organum*: c'est-à-dire les structures ou les processus, invisibles par leur petitesse, dont la connaissance nous rendrait maître des phénomènes perceptibles, macroscopiques, et en ferait comprendre en même temps le caractère rationnel. Tout le mécanisme de type cartésien, l'atomisme chimique, le sous-atomisme physico-chimique, ont été des avances dans cette même direction. Succès sur succès étaient obtenus par cette course vers l'élémentaire, et l'on se moquait des pronostics pessimistes d'Auguste Comte sur la recherche des explications par l'imperceptible.—Et puis, voici qu'en effet, loin d'y trouver la simplicité parfaite et l'intelligibilité qu'on escomptait déjà, la poursuite des structures et des processus ultramicroscopiques nous a lancés dans un monde de plus en plus étrange, si différent qu'il semble exiger une refonte complète de nos concepts fondamentaux, et même des principes de notre raison.

En face de cette situation, les uns—et c'est jusqu'à présent la

majorité—restent convaincus qu'en continuant dans cette voie, nous allons vraiment vers le plus réel et vers l'essence des choses, quittes à modifier notre logique;[24] mais d'autres, au contraire, mettent en question l'idée de chercher le plus réel dans le plus petit. Alain (le philosophe Émile Chartier) va jusqu'à écrire, dans ses *Vigiles de l'Esprit*:[25] "La physique de ce temps-ci fera rire comme une chasse aux lutins." Des doutes du même genre sont soulevés par M. Robert Gérard, Ingénieur des Mines, dans *Les Chemins divers de la connaissance,*[26] formant l'introduction d'une série d'études publiées sous le titre significatif: "Science, language, connaissance": car l'auteur pense avec raison qu'une critique du langage (on pourrait presque dire: du style) est la condition préalable de toute critique philosophique. Aussi préconise-t-il le retour au langage scientifique le plus classique possible et conseille-t-il de modifier notre représentation de l'imperceptible, plutôt que de changer les principes du raisonnement. Les analogies qu'on peut remarquer entre le goût de l'illogique en littérature, et "l'assouplissement" de la logique dans les sciences ne sont peut-être pas de pures coïncidences.

Des idées très voisines apparaissent chez un autre homme de science, M. Marcel Prot, Ingénieur des Ponts et Chaussées. Son *Essai sur la signification du langage de la géométrie*[27] s'élève contre la forme inutilement paradoxale qu'ont revêtue les généralisations modernes de la géométrie classique, "jeux de mots qui ne trompent pas, en général, les esprits avertis, mais qui sont cependant assez insidieux pour compliquer parfois notablement la tâche de ceux qui s'instruisent et qui

[24] Voir p. ex. Bachelard, *La philosophie du non,* dont j'ai parlé dans l'article sur "La philosophie en France" publié ici même en Janvier 1942.—M^me^ Destouches (précédement M^lle^ Paulette Février) a même élaboré une logique à trois valeurs adaptée aux relations d'incertitude des théories quantiques, qui a fait l'objet de plusieurs notes dans les C. R. de l'Académie des Sciences (1937, 481 et 958; 1944, 481, etc.). Elle doit soutenir très prochainement une thèse dans le même sens, intitulée *Recherches sur la structure des théories physiques.*

[25] Pp. 319, Gallimard, 1942, p. 295.

[26] Pp. 193, Vanoest, éd. 1944.

[27] Pp. 59, Hermann, éd. 1940. Cet opuscule n'est d'ailleurs qu'une partie des études de l'auteur sur ce qu'il nomme l'Acribologie, c'est-à-dire la recherche génétique du sens des mots, faite en vue d'établir leur signification exacte, de rejeter les termes équivoques et d'y substituer des termes techniques soigneusement définis. On trouvera l'exposé général et une application très poussée de cette méthode dans son *Acribologie générale, esquisse d'un vocabulaire psychologique méthodique.* Pp. 165, Hermann, 1940.

réfléchissent".—"Pénétré de cette idée qu'un langage, quel qu'il soit, ne saurait avoir de signification claire et précise que dans la mesure où il garde un contact étroit avec la réalité sensible", M. Prot s'est d'abord proposé de ramener toutes les notions géométriques à leurs origines intuitives, puis à critiquer les transformations sémantiques qu'ont subies les termes correspondants. Il conclut en montrant ce qu'il y a de factice dans la séduisante formule d'Einstein: "Pour autant que les propositions mathématiques se rapportent à la réalité, elles ne sont pas certaines; et pour autant qu'elles sont certaines, elles ne se rapportent pas à la réalité."

On trouve enfin le même esprit de réaction contre l'abandon du "sens commun", et des principes de raisonnement constitués à l'échelle de l'action humaine, dans un ouvrage curieux à tous égards, dont l'auteur, M. Lucien Bonnot, est, au sens le plus strict, un autodidacte (il n'a jamais fait, à l'école, que des études primaires) et vit, en anachorète, dans un petit hameau de Bourgogne.[28] Il n'en a pas moins acquis, par ses lectures, une instruction philosophique supérieure à celle de la plupart des licenciés; mais il a gardé une fraîcheur de convictions philosophiques, et une confiance dans la vérité absolue de ses doctrines, qui est un des attraits de son livre. Comme M. Prot, il condamne, au nom d'un empirisme radical, toute prétention des géométries non-euclidiennes ou des mécaniques non-newtoniennes à représenter le réel. Mais il va plus loin: il considère qu'il existe un "ordre naturel" entre toutes les propositions qui se rapportent à celuici, et il rejette, comme une maladie professionnelle, la conception des sciences qui les réduit à des systèmes hypothético-déductifs, pouvant être suspendus *à volonté* à des systèmes d'axiomes choisis d'une manière décisoire. Il réhabilite également la notion pratique de *cause;* et, reprenant la question si mal résolue par J.S. Mill, il oppose à ses célèbres "canons" une nouvelle "syllogistique de la causalité" qui n'est pas une des parties les moins intéressantes de cette originale construction.

Ce n'est pas seulement la physique contemporaine qui suggère des réflexions de cet ordre. Les sciences de la vie, après avoir eu comme

[28] *Essai sur les Fondements de la Logique et sur la Méthodologie causale.* Pp. xxviii, 329, "Les Presses Universitaires", 1943.

idéal ce même mécanisme bacono-cartésien, et l'explication du tout par ses éléments, commencent à chercher d'autres voies. Dans un opuscule assez court, mais plein d'idées, M. Georges Matisse, biologiste de profession, montre qu'il faut adopter une autre attitude mentale quand on passe le l'étude de la physique à celle des êtres vivants.[29] Là, le tout ne peut jamais s'expliquer intégralement à partir de ses composants: "la combinaison est créatrice". La structure différenciée jusque dans ses moindres détails, comme l'avait vu Leibniz, la sensibilité, liée à la solidarité des parties, la nutrition, l'hérédité, le développement suivant un cours défini, forment comme un monde à part. Contrairement à l'involution qui égalise sans cesse dans les corps physiques les températures, les concentrations, les pressions mécaniques ou osmotiques, il se produit un phénomène d'"épictèse", qui consiste en un accroissement d'inégalité. Enfin les réactions d'un vivant ne sont jamais d'une régularité certaine. M. Matisse estime, lui aussi, que la logique est tout entière suggérée par les faits; mais à la logique suggérée par le travail mécanique et manuel, il faut ajouter une autre logique à laquelle nous invite l'observation de la vie, logique du devenir et de la création, logique du sujet changeant et non défini une fois pour toutes, indépendante même des règles de probabilité, car elle est l'antithèse du hasard.

C'est un aspect tout contraire de la Logique qui est représenté par l'ouvrage de M. Marcel Boll, *Eléments de Logique scientifique*,[30] dont le titre pourrait prêter à équivoque. Bien que l'auteur soit un physicien et un chimiste distingué, et qu'il ait écrit sur le calcul des probabilités un petit livre très apprécié, il ne s'agit point du tout dans ces *Eléments* de la logique des sciences, mais d'un manuel de Logistique, où il expose certains aspects de celle-ci avec un remarquable talent de professeur. S'il la qualifie de "scientifique", c'est parce qu'il croit que toute autre logique n'est que grammaire ou littérature. De là vient sa grande sévérité pour ce qu'il nomme "la logique traditionnelle",

[29] *Monde vivant, monde minéral et principe d'émergence.* Hermann, 1942. *Cf.* du même auteur *La question de la finalité dans le monde des êtres vivants*, dans le premier fascicule de la collection "Science, language, connaissance", dont nous avons parlé ci-dessus, et *Sur l'invention dans la nature* (même collection, fascicule II).

[30] Pp. vii, 243, Dunod, 1942. Voir l'analyse critique de cet ouvrage dans le *Revue Philosophique* de Janvier 1945.

"la logique classique". Mais il ne connaît celle-ci que par des souvenirs d'enseignement secondaire, ou par des résumés français d'époque récente, qui n'en sont pas toujours de bons représentants. Une plus grande familiarité avec un exposé solide, comme les *Studies and Exercises* de J.N. Keynes, par exemple, lui aurait montré tout ce que la logique de forme algébrique doit aux travaux accumulés depuis Aristote jusqu'au début du XXe siècle.

Nous ne quitterons pas le domaine des études philosophiques ayant un caractère d'acquisition positive—sous les réserves indiquées déjà—en parlant à cette place du *Traité de Morale générale* de M. René Le Senne.[31] Il fait partie de la collection *Logos,* et le caractère en est vigoureusement présenté dans l'avant-propos de l'auteur: "Une morale est l'œuvre d'un homme qui, connaissant les doctrines traditionnelles et ayant l'expérience de la vie, cherche à déterminer les meilleures règles de notre conduite. Il ne prétend pas exprimer une préférence, mais reconnaître une légitimité, de même que le savant ne se propose pas de faire triompher ses hypothèses, mais de discerner la vérité."[32] Pour lui, d'ailleurs, ceci n'implique en aucune manière que la morale se borne à reconnaître l'existence d'un Bien comme celui de Platon, s'exprimant en des normes immuables auxquelles il suffit de se conformer: elle met en première ligne la *virtus,* le courage moral, l'effort personnel de *self-realization,* et même, dans une certaine mesure, l'invention par laquelle chacun, pour être moral, est tenu d'adapter aux circonstances présentes la directive générale qui exprime la valeur morale absolue. Pour emprunter les termes d'un autre philosophe contemporain, qui espère être en cela tout à fait d'accord avec la pensée de M. Le Senne, et des représentants les plus qualifiés de l'éthique française: "Les régles morales ne constituent pas toute la

[31] Pp. vii, 758, "Les Presses Universitaires", 1942. Outre les thèmes fondamentaux de doctrine qu'il expose, cet ouvrage contient dans sa première partie une excellente collection de "portraits moraux": le sage bouddhiste, le citoyen-philosophe de Platon, celui d'Aristote, le stoïcien, le chrétien, le spinoziste, etc., jusqu'à la religion ruskinienne de la beauté et à l'invention morale bergsonienne. Des bibliographies critiques, générales et spéciales, en font en outre une histoire richement documentée des doctrines morales, anciennes et contemporaines.

[32] "Index thématique", p. V. (On remarquera la justesse et l'originalité de cette expression musicale). Nous reviendrons plus loin sur les conceptions de la valeur qui s'opposent à celle-là.

moralité: elles ne sont que le signe incomplet et toujours perfectible des idées, des sentiments et des tendances qui la constituent."

Deux choses se présentent en relief sur tout le reste, dans cet admirable effort de synthèse éthique: l'une est la valeur de la personne morale, "existante", active, et même dans une certaine mesure, créatrice; l'autre est l'idée que cette création, pour être valable, ne doit pas être arbitraire, mais dirigée dans le sens d'une perfection dont notre conscience peut reconnaître les degrés. Mais ces deux vérités morales me paraissent en appeler une autre: c'est qu'il existe aussi une "mauvaise volonté", sur laquelle l'auteur insiste moins, et qu'il ramène, soit à la lâcheté qui se "laisse aller" à ses impulsions, soit au rétrécissement de la volonté qui s'attache passionnément à une forme unique de valeur, au détriment des autres. Mais n'existe-t-il pas un mal plus radical, qui est de faire de soi le centre du monde, au lieu de se sentir comme l'agent de la valeur suprême? Entrer à fond dans cette discussion serait sortir du point de vue auquel nous nous sommes volontairement limité dans cette première partie de notre étude. La seconde nous ramènera d'ailleurs à d'autres ouvrages où sont en jeu ces questions, et notamment aux *Eléments pour une Éthique* de M. Jean Nabert, qui, à bien des égards aurait pu être aussi bien mentionné à cette place.

Dans l'ordre social, *Le Problème politique et la Démocratie*,[33] de M. Dominique Parodi, est une réflexion approfondie sur les principes moraux de l'autorité et du gouvernement. Cette œuvre, écrite sous la domination allemande, a été publiée dès que la presse est redevenue libre: aussi la plus grande partie en a-t-elle un caractère d'actualité et de discussion historique: on y voit clairement les causes qui ont conduit tant d'hommes politiques à l'admiration des régimes de force et de l'organicisme d'État. Mais l'ouvrage est avant tout destiné à mettre en lumière les principes philosophiques qui justifient la démocratie, à les "traduire en idées" et à les juger "au nom de la conscience et de la raison". C'est ainsi que droit divin, traditionalisme, idéal totalitaire sont discutés avec mesure, mais avec vigueur, et que la valeur

[33] Pp. 160, "Les Presses Universitaires", 1945. L'ouvrage est dédié à la mémoire d'un des fils de l'auteur, "mort dans la prison allemande de Fresnes, le 15 Avril 1942".

fondamentale de la personne humaine en matière politique est solidement établie. "Une société, dit M. Parodi, est par essence un concours de consciences et de personnes", et par suite la question des droits de l'individu "dépasse infiniment le domaine de la politique et du droit, aussi bien constitutionnel que privé: elle est de l'ordre de la morale la plus haute, de la métaphysique et de la religion."[34]

Bien qu'on ne puisse le rattacher spécialement à aucune des questions dont nous venons de parler, c'est parmi les philosophies animées de ce même esprit qu'il faut placer le précieux recueil d'articles dûs au Professeur Arnold Reymond, de Lausanne, et publiés sous le titre *Philosophie Spiritualiste*.[35] Ce titre, en effet, n'est pas l'enseigne d'une métaphysique, mais l'expression d'une orientation morale qui réunit des études variées, publiées primitivement à des dates très différentes, mais qui toutes sont animées du même désir de rechercher la vérité par la raison, et du même sentiment de confiance dans la solidité des grandes valeurs morales, logiques, esthétiques, religieuses, qu'il se refuse à considérer comme de simples reflets, dans la conscience, des conditions de vie précaires de l'humanité. On y trouve, discutées avec talent, des questions d'un vif intérêt: la méthode dans la recherche métaphysique, l'acte de juger et ses conditions, la nature de la raison, la primauté de la logique bivalente classique, que M. Reymond maintient énergiquement par des raisons de grand poids, le sens de l'idée de vérité et la crise actuelle de cette notion, la finalité, la classification des sciences et leur unité, les types de déterminisme, l'intuition géométrique, les rapports de la philosophie et des croyances chrétiennes. Par l'énumération de ces sujets (encore n'est elle pas complète), on se rend compte de tout ce que peut nous apprendre ou nous suggérer cette riche publication d'un penseur aussi estimé.

II

Venons aux ouvrages conçus dans un esprit moins semblable à celui de la recherche scientifique, ouvrant de larges perspectives sur la pensée et sur le monde, plus expressifs, comme les œuvres d'art,

[34] *Ibid.*, 58, 61.

[35] Deux volumes de 429 et 448 pages, publiés par la Faculté des Lettres de Lausanne, et par les amis de l'auteur. F. Rouge, à Lausanne, et J. Vrin, Paris, 1942.

du tempérament de leur auteur, et qui rappellent davantage ce qu'on nommait autrefois *placita philosophorum*—les doctrines et les sytèmes philosophiques.

De la philosophie ainsi entendue, une des grandes sources est la religion: soit que le philosophe vise à satisfaire par la seule raison les besoins qui donnent naissance à celle-ci, soit qu'il tende à la réformer dans ce qu'elle a d'intellectuel, soit enfin qu'il réponde aux objections que soulèvent des croyances répandues à son époque, et qu'il dispose l'esprit à accepter ces croyances. C'est à la fois à ces deux dernières fins que répond l'*Introduction à l'étude du problème religieux*[36] de M. Ed. Le Roy, l'un des plus éminents philosophes catholiques français. Son ouvrage est important à la fois par les idées qu'il expose, et par la situation de son auteur, déjà Membre de l'Institut au titre de l'Académie des Sciences Morales, et qui vient d'être en outre élu à l'Académie Française, où il succède à Bergson. Il n'est pas possible de résumer encore un livre si bref, si dense de contenu, qui concentre les principes du spiritualisme français contemporain, redresse ce qu'il y a d'enfantin dans la représentation courante des dogmes religieux, et vise à justifier une idée de Dieu dépouillée de toute mythologie. La position centrale en est l'établissement de ce que M. Le Roy nomme "l'exigence idéaliste", mais qu'on pourrait aussi justement, dit-il, appeler un "réalisme de l'esprit": c'est le fait que la pensée, la conscience, est postulée implicitement par toute question sur l'existence, et que, par conséquent, cette dernière n'est rien en dehors de la première. Le "choc" nécessaire à l'expérience n'est jamais et ne peut être celui d'une pensée et d'une chose étrangère à la pensée: c'est celui de deux pensées, et plus exactement de ce qui appartient à deux plans différents de la pensée. Cette pensée, qui conditionne ainsi tout le reste, ne se connait en nous que, comme une "Motion", une activitè toujours incomplète, caractérisée par une échelle de valeurs: quelle en est la direction? Un Absolu, impliqué par l'idée même de vérité, quoiqu'il ne soit atteint par aucune des vérités partielles que nous pouvons saisir. Et c'est en suivant cette voie que nous pouvons nous orienter vers la Pensée suprême, reconnaître les *alignements*, comme disent les marins, qui conduisent vers elle, non

[36] Pp. 256, Aubier, 1944.

par une "analogie de proportion", qui violerait en ce cas une règle logique fondamentale, ni même par une "analogie d'attribution", qui serait toute verbale, mais par une "analogie de comportement" qui est la véritable *via eminentiae*, et qui s'achève par la révélation.

La religion révélée et traditionnelle mise à part, c'est un esprit très voisin qui anime le nouvel ouvrage de M. Louis Lavelle, *Du Temps et de l'Eternité*.[37] La profondeur et l'ingéniosité philosophiques de cette oeuvre n'excluent pas un souci de clarté et d'élégance, qui en rend la lecture facile, et même passionnante pour ceux qui possèdent quelque "sensibilité métaphysique". Les thèmes fondamentaux en sont le caractère absolu de l'esprit, sa participation à l'Acte universel, l'idée que l'homme n'est pas seulement un être, mais un mouvement créateur, que son essence est "faire, et en faisant, se faire".[38] Mais par la nature métaphysique de cet acte, le temps est dans une liaison constante avec l'éternité, et par suite nous la révèle. Ce n'est pas que M. Lavelle néglige l'aspect physique du temps, ni son aspect moral : on trouve dans son livre une interprétation de la Relativité, une discussion de ce qui justifie l'irréversibilité du temps physique ; on y trouve aussi une belle analyse de la fidélité à soi-même et à son idéal. "Il y a dans chaque chose, conclut-il, une face tournée vers le devenir et une face tournée vers l'éternité."—"S'il y a une expérience de l'éternité, c'est au cours de notre vie elle-même qu'elle se réalise. . . . Aussi ne s'agit-il pas d'obtenir l'expérience la plus longue, mais la plus profonde."[39]

Il faut rapprocher de ce livre, à la fois par les hautes qualités de l'auteur, par la vigueur de la pensée, par la nature même de la doctrine, les *Éléments pour une Éthique*[40] de M. Jean Nabert. Sous ce titre modeste, c'est aussi toute une psychologie réflexive et toute une métaphysique de l'esprit qui s'y trouvent exposées. Pour lui aussi, le moi empirique trouve, en s'approfondissant lui-même, une "conscience pure" qui le met en rapport avec un Absolu, principe de toutes les valeurs. M. Nabert appartient—si l'on peut ainsi parler en dehors

[37] Pp. 446, Aubier, 1945.
[38] Expression de Lequier (*Recherche d'une première vérité*, opuscule écrit vers 1840) ; elle a été rendue célèbre par Renouvier, et est toujours restée une des directives du spiritualisme français.
[39] *Ibid.*, 411, 429, 438.
[40] Pp. 239, "Les Presses Universitaires", 1943.

de toute Église—à la même religion que M. Lavelle. Et cependant, son livre est loin d'avoir la même tonalité. D'abord, en ce qu'il part expressément du point de vue moral: c'est en étudiant en moraliste l'expérience de la faute et de l'échec, le sentiment de la solitude qu'il remonte à "l'affirmation originaire" du transcendant. L'analyse de la communication des consciences, et la valeur de l'identité spirituelle entre leurs contenus y tient une place de premier rang.[41] La notion de l'être, bien qu'elle ne soit pas absente de cette profonde méditation sur l'homme, y joue un rôle bien moins marqué: l'attitude générale retient beaucoup plus de la critique Kantienne; les valeurs y subsistent davantage par elles-mêmes, sans chercher aucun appui ontologique. Les derniers mots sont caractéristiques de cette réserve, car il y est aussi question de l'éternité, mais non pas dans les mêmes termes: "Pour s'élever à l'idée ou à l'expérience de l'éternité de la pensée, il suffit d'une reprise réflexive de l'acte intellectuel. . . . Nous expérimentons alors une régénération qui se sait exposée à un rythme de fléchissement et d'exaltation, mais qui puise dans cette tension même une certitude plus assurée de soi. Cette sérénité est le substitut de l'éternité; elle est toute l'éternité concevable pour une conscience s'efforçant de s'égaler à soi, et ne le pouvant que par l'emprunt aux forces de l'individu. . . . Cette sérénité rayonne sur la vie elle-même; elle en fait la douceur et la profondeur; elle est le pressentiment de ce qui doit demeurer, en toute rigueur, invérifiable."[42]

Par son sujet, le livre de M. Ferdinand Alquié, *Le désir d'éternité*,[43] s'apparente aux précédents. Et par ses conclusions, il ne se tient pas à un niveau moins élevé de philosophie générale. L'auteur est un des plus jeunes parmi nos écrivains philosophes, et son livre n'est pas bien long; mais il manifeste un sérieux, une mesure, on pourrait presque dire une autorité qui permettent d'attendre beaucoup de ses travaux futurs. Il part d'une analyse attentive aux réalités; approfondissant ce fait d'observation, si remarquable, qu'on pourrait appeler "la haine

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[43] Pp. 160, "Les Presses Universitaires", 1943.

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Le Choix, par M. Jean Grenier,[46] appartient nettement au même ordre d'inspiration, avec quelques caractères qui lui sont propres. It utilise bien plus qu'on ne le fait d'ordinaire les doctrines de l'Inde, dont il tire plusieurs textes frappants. Quoique nous le citions à cette place, pour le bon ordre des idées, il est plus ancien que les études dont nous venons de parler. Son objet propre est de confronter la notion de choix libre et celle d'Absolu, qui, pour lui, constitue le fondement de toute pensée. Mais cet idéal ne peut être atteint ni par les produits de l'intelligence, dont aucun ne saurait se justifier d'une manière absolue, ni par le résultat des actions, où l'on ne peut établir des différences de valeur que dans le relatif. Du point de vue de l'Absolu, le pyrrhonisme est le vrai: οὐδὲν μᾶλλον. La norme de notre vie spirituelle est-elle donc en contradiction avec les exigences de l'activité? Non, parce que dans un cas comme dans l'autre, ce n'est pas aux effets, c'est a l'acte de juger ou de choisir que s'attache la valeur absolue. Ce que nous décidons, c'est d'être tel ou tel. Ici encore résonne l'écho du mot que nous avons déjà rappelé: "Faire, et en faisant, se faire". La matière de l'acte ou de la croyance s'efface

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[46] Pp. 149, "Les Presses Universitaires", 1941

devant l'intention de celui-ci, comme la diversité des langues devant une même verité qu'elles expriment en mots différents. Comme le dit M. Lavelle, que cite en finissant M. Grenier: "L'indifférence à l'égard de tous les évènements n'est que l'effet de leur disproportion avec cet amour de l'infini qui se trouve au fond de notre âme, et qu'aucun objet fini n'est capable de retenir."

Tous ces ouvrages sont d'une pensée si personnelle qu'on hésite à les affaiblir par des noms en *isme*. S'ils peuvent être dits spiritualistes, ils font aussi songer au grand rôle joué depuis quelques années dans la pensée française par ce qu'on nomme volontiers l'*existentialisme*. Mais c'est un drapeau porté par tant de mains qu'on ne sait au juste quel en est le légitime possesseur. M. Le Senne, dans son *Introduction*, parle bien spirituellement de "l'éventail déployé" auquel ressemble l'existentialisme français: on y trouve un centre, il est vrai, mais des directions diverses, et même diamétralement opposées. S'il fallait concentrer cette qualification sur un type particulier de doctrine, on en aurait sans doute le représentant le plus authentique dans *L'Être et le Néant, essai d'ontologie phénoménologique*[47] de M. Jean-Paul Sartre. Cet énorme ouvrage de haute abstraction n'est pas de lecture facile—quoiqu'il soit dû à un dramaturge et romancier bien connu—et son vocabulaire très spécial, emprunté pour une part notable à Heidegger, demande un véritable apprentissage. Si l'on a le courage d'aborder ce livre comme on étudierait un auteur ancien et difficile, on y trouve quantité d'analyses subtiles, d'une rare activité d'esprit, dont quelques unes rejoignent par des chemins ardus des vérités classiques, dont quelques autres sont hasardées, mais dont la plupart sont très propres à assouplir la pensée, à l'élargir, et surtout à lui faire sentir combien de présuppositions discutables peuvent se glisser subrepticement dans la seule manière de poser les questions.

Par ses dimensions comme par son contenu, *Les différents modes d'existence*[48] de M. Etienne Souriau (les deux ouvrages ont paru presque à la même date) s'oppose à bien des égards à celui de M. Sartre—sans oublier que les contraires sont d'un même genre: car

[47] Pp. 724, en petits caractères. "Bibliothèque des Idées". (Éditions de la Nouvelle Revue Française.) Gallimard, 1943.

[48] Pp. 168, "Les Presses Universitaires", 1943. La citation ci-dessus est à la page 120.

il est non moins métaphysique, non moins personnel dans son langage, non moins riche en néologismes. Mais pour lui la notion d'être n'est pas univoque: l'existence est "plurimodale". "Toute tentative pour légitimer les modes de l'être à partir de l'un d'eux considéré comme privilégié, est une faute grossière. . . . Chacun peut être subordonné aux autres, pris dans un certain ordre. Mais pris chacun en soi, *tous sont égaux*." Et d'autre part, loin de juger comme M. Sartre que l'idée de Dieu est contradictoire, il fait une large place à la "surexistence", vers laquelle l'oeuvre d'art et l'"existence moralement qualifiée" nous ouvrent des voies d'accès, et qui constitue un ordre supérieur de réalité.

Au grand usage qui s'est fait d'"existant", d'"existentiel", et même d'"existential" dans la philosophie française de ces dernières années s'est jointe aussi une propension très générale à user du vocabulaire spécial de Husserl: phénoménologie, essence, intentionnel, réduction, "mettre entre parenthèses".[49] Pendant une première période, qui commence vers 1930, ces termes ont été employés de plus en plus, mais dans des sens assez divers, si bien que "phénoménologie" dans l'usage courant, ne voulait plus dire que description expérientielle et conceptuelle, et que des contestations n'étaient pas rares entre ceux qui parlaient ce langage, sur la conformité de leur "phénoménologisme" à celui de Husserl.

Ces contestations ont pris fin avec la publication d'un ouvrage de premier ordre, bref; mais décisif, de M. Gaston Berger, *Le "Cogito" dans la Philosophie de Husserl*.[50] A propos de cette notion, centrale dans la pensée de l'auteur (bien qu'elle prenne tardivement cette place dans ses ouvrages), M. Gaston Berger a donné un tableau précis des idées de Husserl: il retrace leur développement, parfois un peu déconcertant à première vue; il en montre la véritable unité; il explique avec lucidité et pénétration ce qu'il faut entendre par phénoménologie, par l'opposition du psychologisme et du logicisme,

[49] On sera peut-être étonné de trouver une influence allemande si marquée dans les ouvrages dont nous venons de parler et dans plusieurs autres; mais il faut se rappeler que s'ils ont paru récemment, ils avaient été pensés, préparés avant le guerre ou tout à son début, dans une période où le prestige des "obscuristes" allemands était encore intact.

[50] Pp. 159, Aubier, 1941.

l'intention, l'intuition des essences, la "réduction eidétique" par laquelle on l'atteint, la "réduction phénoménologique" et l'ἐποχή qui en est l'instrument, l'"évidence transcendentale", l'"Ego transcendental", l'"expérience transcendentale". Cet exposé est critique, en ce sens qu'il montre certaines difficultés d'interprétation, certaines précautions à prendre pour l'intelligence de la doctrine, et même certains défauts de Husserl dans l'expression de ses idées; il n'est pas critique en ce sens qu'il s'abstient systématiquement de les discuter. Cette discussion, et les idées de M. Gaston Berger lui-même sur ce point, on les trouvera dans son bel ouvrage *Recherches sur les conditions de la connaissance,*[51] qui n'est pas une "théorie de la connaissance", au sens traditionnel de cette expression, et qui tout au contraire en montre l'impossibilité. Dans ce travail, si original, viennent cependant s'unir, de la manière la plus naturelle, les thèmes qui dominent actuellement la philosophie française: l'intentionalité et l'activisme, l'importance des significations (il est à peine nécessaire de le dire après avoir parlé du *Cogito*): l'existentialisme, en tant que la position de l'être conditionne la connaissance, et aussi en tant qu'un existant, au sens concret et individuel de ce mot, en est nécessairement le support. Enfin le problème des valeurs y occupe une place centrale; l'auteur admet qu'il ne peut y avoir de jugements de réalité qui ne soient pas des jugements de valeur; mais il se refuse cependant à faire de la vérité une valeur placée sur le même rang que les autres: il faut qu'il y ait une vérité des valeurs pour qu'elles ne soient pas de simples préférences individuelles.

Les valeurs: tel est peut-être en effet le problème le plus débattu en ce moment. La "Société française de philosophie", qui avait dû interrompre ses séances pendant l'occupation, les a reprises en consacrant les deux premières discussions à ce sujet.[52] L'origine de ce mouvement, en France, a été modeste: il s'est introduit d'abord, au commencement de ce siècle, sous une forme limitée et technique, à propos de la classification et de la méthodologie des sciences: la revendication d'un caractère spécifique des "sciences normatives" et

[51] Pp. 195, "Les Presses Universitaires", 1941.

[52] 28 Avril et 26 Mai 1945. Une précédente séance, à la fin de Janvier, avait été consacrée à la mémoire de Léon Brunschvicg, l'un de ses plus anciens membres.

la défense de leur légitimité. Confondant "norme" et "commandement", beaucoup de philosophes soutenaient alors qu'il ne peut y avoir de science normative, en s'appuyant sur la remarque, d'ailleurs très juste, de Poincaré que "d'un indicatif on ne peut déduire un impératif". Mais ni l'esthétique, ni la logique, ni la morale ne visent à ce tour de prestidigitation: elles sont des sciences *normatives* comme la thermodynamique et l'optique sont des sciences *physiques:* elles ont pour point de départ comme pour point d'arrivée des jugements de valeur, entre lesquels elles établissent des rapports. Leur développement a conduit à réfléchir sur cette notion, à la défendre contre certaines attaques, à en faire l'objet d'une critique philosophique: telle est proprement l'*axiologie,* qui occupe par rapport aux sciences normatives immédiates, la même position que les recherches de Meyerson ou de M. Bachelard par rapport aux sciences de la nature. Dans l'*Introduction à la philosophie* de M. Le Senne, dont nous avons déjà parlé, cette question était centrale; on y trouvait deux chapitres intitulés, l'un: "Les Valeurs", l'autre "La Valeur ou Dieu", qui représentent la forme la plus métaphysique et la plus hardie de cette conception; elle est présente, quoique moins soulignée, dans son *Traité de Morale générale.* Je ne crois pas que dans son fond, celle qui se dégage des ouvrages de M. Lavelle en soit différente. J'ai déjà dit plus haut quelle relativité plus accentuée se manifestait dans les *Eléments pour une éthique* de M. Nabert et dans *Le désir d'éternité* de M. Alquié. Mais parmi les travaux récents, *La Création des Valeurs,*[53] de M. Raymond Polin représente la conception des valeurs la plus éloignée de l'esprit religieux. On se rappelle peut-être cette phrase autrefois célèbre de W. K. Clifford: "Celui qui a fait tous les dieux et qui les détruira tous, notre père l'Homme qui nous regarde avec l'éclat de l'éternelle jeunesse dans les yeux, et qui nous dit: Je suis celui qui était avant que Jéhovah fût." Elle aurait pu servir d'épigraphe au livre de M. Polin: pour lui, le fait psychologique des valeurs est indubitable; leur affermissement concret dans la vie sociale n'est pas moins positif. Elles deviennent transcendantes en ce qu'elles s'élèvent au-dessus des individus: mais elles sont toujours des créa-

[53] Pp. 306, "Les Presses Universitaires", 1944. Cf. du même auteur *Essai sur la compréhension des valeurs.* Pp. 138, *Ibid.,* 1945.

tions de ceux-ci. L'homme, qui pense vraiment, et qui réalise pleinement son humanité dépasse sans cesse ce qu'il était au moment précédent: "Pour la conscience humaine créatrice des valeurs, il n'y a plus extériorité du divin et du transcendant, mais intériorité de l'activité de transcendance." La valeur acceptée, reconnue, est un triomphe de l'inventeur qui est arrivé à l'imposer soit par la force, soit par une adhésion spontanée de ceux qu'il convainc. Il n'existe en dehors de ce pouvoir et de ce risque "ni fondement ni objectivité des valeurs; elles échappent aussi bien à toute réalité qu'à toute détermination."[54]

On reconnaît dans cette thèse, transposés sur un plan nouveau, celui de la libre création et de la self-transcendance, l'idéal nietzschéen de rénovation des valeurs par l'individu, et la vieille conception agonistique de la lutte pour la vie. Et c'est vraiment une révolution curieuse, quoique peut-être momentanée. Quand la théorie des valeurs commençait à prendre une grande place dans les intérêts philosophiques, les uns la dénonçaient comme une idéologie bourgeoise, les autres comme une apologétique chrétienne dissimulée. Mais cette notion correspondait si bien à la réalité, elle s'imposait "phénoménologiquement" avec tant de force, qu'elle a rapidement triomphé de ces défiances ou de ces attaques, et que personne ne lui fait plus un procès de tendance. Aujourd'hui, c'est à l'intérieur même de l'*axiologie* que se reproduit de nouveau l'éternel conflit qui s'est déroulé sous le signe du rationalisme et de l'empirisme, du spiritualisme et du matérialisme, de la dualité humaine et du biologisme universel.

Est-ce à dire que sur ce point il n'y ait aucun progrès en métaphysique? Je ne le pense pas: il suffit pour s'en convaincre de voir combien, avec les nouvelles formes de cette antithèse, la contradiction est moins brutale entre les deux termes opposés. Là aussi, comme dans le conflit des théories de la raison, dont nous parlions un peu plus haut, il ne faut pas désespérer de trouver des thèses où puissent se mettre d'accord, sinon tous les hommes, du moins tous les esprits sincères et de bonne volonté: car on ne peut guère espérer que l'élucidation des valeurs suffise à faire disparaître l'opposition entre le mépris et l'amour du beau, entre la mauvaise foi et le respect de

[54] *Ibid.*, 86, 290, 291.

la vérité, entre le désir d'être maître du monde et l'idéal de communion universelle, en un mot entre les deux directions contraires entre lesquelles se sont toujours partagées les volontés humaines.

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MATERIALISM AND RELATIVITY: A SEMANTIC ANALYSIS

THERE can be little doubt that much uncertainty as to its full import has been left in the wake of the theory of relativity. Assuredly realistic philosophers have not been satisfied as to its significance when taken as more than a technical device in physics. It is not surprising, it needs scarcely be said, that positivists and pragmatists have been the least skeptical and critical of all, for these philosophical groups do not really believe in a material universe. The positivists, particularly, have made a fetish of expressions, such as observation and observables, while ignoring the realistic thesis that we can observe material things *through* the data of observation. May it not be a dogma, associated with an inadequate theory of perception, that we observe only the data themselves, that human cognition terminates on the data?

Now the point I am making is this, namely, that the theory of relativity has been less examined than it should have been, because of the philosophical fashion it harmonized with, supported, and, in no small degree, was itself the expression of. We must not forget, as most English and American physicists do, the methodological influence of Mach and Avenarius upon Einstein's way of thinking. His device fitted in with positivism and was, in many ways, a peculiarly elegant development of that mode of thought. That was one reason why an English or an American physicist would have been unable to conceive it. Nor is it surprising that relativity has helped to bolster up positivism and give it moral support. The resulting state of affairs can be compared to a circular reflex in which the response reenforces the stimulus.

It seems to have become a fashionable dictum that the unobserved has no meaning for physics. But this is, obviously, nonsense; for an eclipse calculated for the past can never be observed by the scientist. He can only assert that he believes that it could have been observed by an observer living at the assigned date. And it is well known that many submicroscopic entities are more inferred than observed. As I shall endeavor to show, much of this language represents the emotional reaction of the modern physicist to his recognition that he was unbelievably naïve in respect to problems in theory of knowledge before the new developments woke him up. He seems to have believed that he could observe points in a Newtonian Absolute Space and locate moments in a corresponding Absolute Time. It is not at all surprising that, in his confusion, he has swung to the other extreme and delivered himself into the welcoming hands of positivists and idealists. The truth of the matter is, as I see it, that he is naturally only an amateur in theory of knowledge and is easily misled. When pressed, he is prone to take refuge in the expression, "Only observables have meaning *for the physicist*", thus retiring into his citadel.

As a physical realist I am not dealing in unknowables. I can know things and events only by means of my observations and inferences therefrom. But that does not reduce things and events to my observations. Otherwise we confuse existence with human knowledge and its conditions. In talking with scientists recently, in order to check up on their language and modes of thinking, I was impressed by their neglect of this, to the philosopher, obvious distinction. They evidently concentrated on magnitudes and numbers rather than on what was being measured, on symbols rather than on what was being symbolized. It seems likely that the development of mathematical physics as against the old mechanical physics has increased this mode of thought. Relativity with its *s-t*, that is, its numbers which are interconnected and transformable from one frame to another, has, I feel, assisted this tendency. As one astronomer frankly said to me, I never bother about existence; my concern is with space-time magnitudes. To the physical realist, of course, this means that knowledge and its categories have crowded out any thought of existence and its categories. The philosopher sees that there is need for

semantic analysis. It is possible that he is the only one who can carry it through and do justice to all the necessary distinctions.

Now the need for such a semantic analysis is peculiarly apparent to the materialist. He finds that pragmatists and positivists hide behind the theory of relativity like doughboys behind a protecting earthwork. There is no getting around it. The materialist must storm the position and reduce it to its proper significance as a technical device.

I

Suppose it is the case—as I presume everyone not mentally corrupted by sophistications would tend to believe—that there are a multitude of events throughout the universe simultaneous with the beating of my heart or the ticking of a clock, though we are not in a position to give them a temporal assignment or dating, does it follow that the conception of such ***absolute simultaneity*** is meaningless? It is surely meaningful for anyone who accepts a material universe, who accepts existence. And if a physicist really is concerned with material things then it is meaningful for him. Naturally this does not mean that we must accept the Platonic reification indulged in by Newton under the suggestion of the Cambridge Platonists of his day and his own theological proclivities. Since his day, philosophy has become empirical in its attitude. After all, Locke, a contemporary of Newton, began the shift in that direction. As I see it, the difficulty was to overcome ontological dualism and, by moving onward to an adequate materialism, to get rid of the horror of "metaphysics". In other words, the job was to get back to physics as knowledge about the material universe at its basic level.

Such a clarification of the situation required an adequate theory of knowledge and some rudiments of ontology. Out of their union could have come a framework for a natural philosophy superior to that of Newton's. Instead, as I see the situation, physics and positivism have tended to move away from such a desirable consummation towards operationalism and a kind of factualism hanging in the void. And I cannot help but feel that the theory of relativity has encouraged this emphasis.

In this paper, then, I am going as usual to "stick out my neck" and defend materialism by making space and time adjectival and by discriminating different meanings—I find at least three for both space and time and I am led to distinguish sharply between motion and movement. In all this, I shall write as a philosopher, although I hope that some of my distinctions may have significance for physics, which, after all, is not such a mysterious science, even though it deals with very small things and events and often in a statistical fashion. While full of admiration for its achievements, these have never thrown me into a mystical condition, ready to say good-bye to common sense and to proclaim "free-will", either because photons affected electrons and made certain calculations uncertain, or because we have only statistical knowledge about the probable paths of radiations. Nor was I surprised that very small things acted somewhat differently from massive aggregates; for that seemed logical enough, since I was well aware how sketchy the knowledge gained in sense-perception is, just because sense-perception is the most elementary level of external knowledge. In other words, I could hardly be a competent philosopher and not be a little sophisticated in such matters. One reason was that in the first decade of the twentieth century I had been telling scientists that matter could not be the sort of thing they believed it to be; that, if it were, organization, evolution and naturalism would be precluded. The new physics was a relief—the sort of thing a critical materialist would expect.

A few more words about "natural philosophy" are in order, because I believe that it is time to give physics the context of a natural philosophy; not, of course, of the romantic speculative sort in which philosophers tried to discover fact *a priori* and spin scientific theories out of *Geist*. But a natural philosophy which has an adequate theory of knowledge and some notion of categories like being, existence, causality, space and time. One of the purposes of the present study of relativity is to further such a natural philosophy.

It is because of the lack of such a clarified physical realism, I believe, that men like Eddington and Jeans—and they are not the only sinners—wander abstractedly, though confidently and brightly, between theology and tales of philosophic lore picked up here and

there. Now, only Mind is real. Next, we hear of a Platonic demiurge. In another mood, hints are offered of Kantian things-in-themselves, of Spinoza's double-attribute thesis, the whole sprinkled with suggestions of Berkeley and Hegel. The lightheartedness and irresponsibility of it all rather shocks the technical philosopher who has been trying to do careful analytic work and integrate epistemology and ontology. On the whole, I prefer the positivist tradition because of its economy and lack of piety. One can at least know what their philosophy is. Pious Englishmen and pious Americans are neither fish nor fowl nor good red herring when they seek to harmonize science and theology.

In connection with the present study I was reading Eddington's book, *The Expanding Universe,* and came across the following delightful passage which I must share. Aware that the assumption of an absolute origin to the material universe got science into difficulties, he proceeded to do some dialectical steps to the effect that ***absolute sameness*** and ***nothingness*** cannot be distinguished philosophically, and then added: "I do not picture a worn out world careering forlornly through the rest of eternity. What is left is only a few ***conceptions*** which we forgot to put away after we had finished using them."[1]

So far as I am aware, Einstein does not do this sort of thing. All the more honor to him. In his recent contribution to the Russell-Schilpp volume he seems to plead for "metaphysics" and propound something that looks like Kantianism. But it is all very sketchy, only suggesting a certain dissatisfaction with positivism.

It really seems that, until the Michelson-Morley experiment came along to perform the Humian job of arousing them from their dogmatic slumbers, physicists tended to think that there were points and positions in an Absolute Space and in an Absolute Time of a receptacular sort. The scheme was that of seventeenth-century intuitionalistic rationalism quite analogous to that of the corresponding conception of Euclid's axioms as intuitive truths about the universe. Modern theory of knowledge seems scarcely to have affected them. Of course, Euler had wavered after reading Berkeley; and Ernst

[1] *Op. cit.,* 82.

Mach had gone over to the Humian extreme. But these men were exceptions.

The result was that, when physicists saw the absurdity of their antique rationalism, they stampeded to this other approach while scarcely realizing what was involved. The stress now lay upon observation, observables and operations. These became the empirical factors which alone had meaning for science. Now, as against those mythological realities, Absolute Space and Time, there was sense in this emphasis. Unfortunately, the material universe tended to be like the famous baby poured out with the bath. The very idea that a physical universe could be known *through* their observations and thus become observable tended to rank as a heresy. Thus do pendulums swing.

In line with this fashion, we are constantly told that Einstein has *analysed* the concept of time for the physicist. It is my considered opinion that this statement is extreme. What he did was to define a *time-interval* in terms of an operation involving the passage of light over a distance, at a velocity invariant for any frame of reference. It was an affair of definition and stipulation. In the same connection, he supplemented an operational definition of a time-interval by the conception of *relative* operational simultaneity. To an observer in one frame it would be *as though* events simultaneous in his own frame would not be such for the other frame. It is a philosophy of the *als ob*. Numbers are to be assigned in accordance with these principles.

The least consideration of the way in which experimental data are secured shows us that Einstein kept for the laboratory the traditional instrument of scientific time, namely, clocks, and with them local absolute simultaneity. Clocks must be synchronized. And it is assumed that they tick away merrily. It is distance which brings with it epistemic difficulties, requiring the use of light signals. Operational simultaneity does not conflict with absolute simultaneity.

It is when the sea-change of the postulational scheme is thrown over physical systems moving uniformly with respect to one another, that we have numbers assigned in accordance with relative operational simultaneity. Such numbers are assignable to the moving system with respect to the observer at rest. In each physical system, by itself,

proper magnitudes are obtainable by measurement and, presumably, represent absolute facts, granted the units. There is no change in laboratory technique and assumptions.

II

So much in the way of review was necessary. It should be noted that clocks and scientific time are presupposed. What is added is a definition of a time-interval in terms of an operation using the passage of light over distance with an invariant speed of some 186,000 miles per second. This velocity is, in the laboratory, empirically measured.

My intention is not to attack the logic of the stipulations and definitions but to raise the question of the meaning of the entire set-up. It will be my thesis that there has been confusion between physical systems as parts of the material universe, and frames of reference for observers; *a natural confusion just because it was generally supposed that the Einstein formula was the solution of the paradox of the Michelson-Morley experiment.* I shall argue, on the contrary, that it was *not* such a solution and that it is only an ingenious kinematic device using stipulations and giving space-time numbers for certain cognitive purposes. Naturally, I shall offer my own solution by showing that, once we give up the preconceptions of past physics, we should expect no interference in the M-M experiment.

Another point is important. As a result of the tendency to reject absolute simultaneity as meaningful for the material universe—no one is more vociferous about this than the positivist, except his companion, the pragmatist—physicists became convinced that the observational time assignments were of exclusive significance. The job was to keep the laws of nature invariant with respect to different frames of reference. The extension of dating and time-intervals had become a hazardous, and yet necessary, undertaking; whereas in classical physics no one bothered about it. Now lengths and time-intervals were equally relative and physics had become sophisticated with respect to observers. Hitherto, of course, observers just noted coincidences and simultaneities in the laboratory and worked out ratios as absolutes. They then dropped out of the picture. Now they

became part of the picture itself. The set-up relativized all magnitudes.

Needless to say, I am not attacking the logic of the postulational set-up, and, if the physicists find the method of value, they are, of course, judges of its usefulness. All I am going to do is to show that we can get back our material universe and again conceive extensities as absolutes.

The philosophical background of my semantic analysis is, as I have indicated, physical realism. I shall try to define time as change, rejecting Newton's Absolute Time. That is, time is a characteristic of a dynamic universe. A time-interval becomes factual knowledge about a process of change in terms of some clock or uniform movement, and requires for its achievement a mind able to note simultaneities, past and present. In other words, a time-interval is always a case of knowledge and not of intuition. It demands technique, comparison, memory. Nevertheless, it constitutes genuine knowledge about a process having duration. It should not be forgotten, however, that, in nature, the past has ceased to exist, that there is no literal interval in nature waiting to be measured. It should be a commonplace of philosophy that the *categories of knowledge,* interested in routines, durations and predictions, are different from the *categories of existence.*[2] The precise nature of this divergence leads into the heart of ontology. There are no readymade cosmic time-intervals as for Newton.

Scientific time would be badly conceived as an intuition of Newton's Absolute Time. It is, instead, knowledge about the durations of processes in terms of some accepted standard duration, such as the movement of the earth around the sun, divisible into units so that magnitudes, called time-intervals, can be assigned. Calibrated clocks are ordinarily used; and it was generally assumed, before relativity, that mere change of place without alterations in temperature made no difference to the rhythmic working of the clocks. There was a lot of nonsense written about the isotropic character of abstractions called Space and Time; but that, again, was merely a mode of speak-

[2] I pointed this out in *The Principles and Problems of Philosophy* (1926), ch. 17.

ing. There is no such thing as Space and no such thing as Time. Back of this mode of speaking lay lack of analysis of the expressions "in space" and "in time". Because of that lack of semantic analysis, these expressions were taken too literally, as though things and events were located in empty absolutes. It will be one of my purposes to show that physical space and time are adjectival and that "in space" and "in time" are technical expressions signifying that geometrical principles and chronometric methods are applicable. The lingering influence of Newtonian cosmology has confused both scientists and philosophers.

The concept of simultaneity is as important as that of time-interval, and implied by the latter. Since I am going to defend absolute simultaneity as meaningful, I must make a few remarks on the subject at this point. There has been much confusion between awareness of simultaneity and the fact of simultaneity. It is true that awareness of simultaneity of an intuitive sort only occurs when there is the compresence of two events in the consciousness of an observer. What is intuited as simultaneous consists of co-actual changes in the field of consciousness; but, since people are apt to be naively realistic, they are prone to believe that the external events which are the causes of these changes are likewise simultaneous. A little reflection leads to the rejection of such a belief. We conclude that neither external simultaneities nor time-intervals can be intuited. Before Einstein, there was no great interest in determining simultaneities beyond the earth, for the correlations between t and s, as in Galileo's law of falling bodies, were supposed to hold elsewhere. Simultaneity was not regarded as a significant variable but as an absolute. Of course, after Ole Roemer's discovery of the finite velocity of light, it was recognized that a calculation would have to be made to determine when the light that reached our eyes had left a star. But that was a simple idea.

What, then, do I mean by absolute simultaneity? Merely the fact about the members of a class of events to the effect that they have actuality in common. Of events which have ceased to be and are past, we can say that they *were* simultaneous. That signifies that, when they were actual, they had their actuality in common. In the

strict sense, only actual events are events, that is, existing changes in some region. Past events do not exist for nature. It is the human mind with its capacity for memory and historical knowledge that peoples the universe with ghosts. And because science is interested in calculations about what was, and in predictions as to what will be, it tends to live in the realm of knowledge and to have too slight an awareness of the texture of existence. Past, present and future tend to become of the same type—*as they are for knowledge*. But it would be a poor philosopher who would not point out that only the actual state of affairs exists, that existence is a process within enduring being.[3]

Such a conception of absolute simultaneity does not depend upon the ability of the human mind to know what events are simultaneous. Nor does it depend upon an appeal to some cosmic mind. To the realist, what is does not depend upon any act of awareness. The job of the scientist—if he finds such knowledge important for his purposes—is to work out a technique, just as he has worked out a technique to measure time-intervals. So far as I can see, Einstein's operational method of determining the synchronization of clocks is a satisfactory one. But there is no great mystery about it. In fact, it can be checked within a physical system by moving a clock from one place to another. It is the conception of relative operational simultaneity which is the novelty, together, of course, with the redefinition of time-interval in terms of the passage of light over a distance, a preparation for the relative type of operational simultaneity.

To sum up these preliminaries. In the first period after the Michelson-Morley experiment, the preconceptions of most physicists involved an Absolute Space, an Absolute Time, a luminiferous ether, the velocity of light in ether or "in space" (the two expressions were used interchangeably). Lorenz, a good physical realist in intention, as most experimentalists tend to be, suggested a shortening of rods in the direction of the supposed motion of the earth through ether or in space. *It is all these preconceptions which I challenge.* I see no good

[3] I would call attention to my article, "Reformed Materialism and Intrinsic Endurance", in this *Review*, July, 1944. For absolute simultaneity as co-actual events see *The Philosophy of Physical Realism.*

reason to believe in either or in "space as an associate". In other words, I can see no good reason why we should not expect the non-interference the experimenters found. *They expected something else just because of their preconceptions.* But this is to anticipate.

My thesis is, then, that Einstein as a Machian merely sought to handle the data without bothering about the material universe. His was an elegant, mathematical, postulational set-up. The material universe of the plain man and the experimental scientist tended to drop out of sight, as it always has for the Machian. It is amusing to remember how many have asked, Do the rods shorten for relativity? Or is it as though they shortened? The answer is, of course, the second one. We move into a world of numbers and of *als ob*. Realism is left behind. It is *knowledge* for observers tied to a postulational set-up.

Now this may satisfy the mathematical physicist, moving in a realm of symbols, but it cannot satisfy a materialist. It may also satisfy pious idealistic Englishmen for whom the material universe is a manifestation of Mind or a mathematical God. It may content non-philosophical American physicists who are really only interested in handling magnitudes and making calculations; for it would seem at times as though the joke made by Russell about mathematicians, to the effect that they did not know what they were talking about, has become somewhat applicable to physicists, especially, perhaps, to mathematical physicists. One very able theorist informed me that *things* are not measured but that data are handled consistently in terms of measurement rules.

As I see it, then, materialism is not "metaphysics" but just the usual belief in chairs and tables and in their microscopic constituents. What is needed is a natural philosophy, better than Newton's, to give existential significance to the mensurational knowledge and laws achieved by physics. While I admire the technique of physics, I cannot, for the life of me, see that it is any less, or any more, about the material universe than the other sciences. And so far as the theory of relativity has encouraged a kind of philosophical obscurantism I am concerned to debunk it, that is, to give it its proper context and range.

III

I suppose that this is the right moment to bring in my own solution of the results of the Michelson-Morley experiment. After that, I can develop in detail my semantic analysis of "space" and "time", "motion" and "movement".

The essential thesis is a simple one. If we drop out such preconceptions as ether and Newtonian Absolute Space, and even the carry-over of Space with a capital, then we can give up the frame of thought with respect to light, which could think of it only as in motion with respect to a background called ether or Space. It then becomes possible to regard it as an electro-magnetic activity, or movement, consisting of self-repeating pulsations spreading out at a determinate speed. And I do not mean by "speed" here the same thing as I mean by velocity. One does not get velocity until one puts the activity "into space", that is, gives it a frame within which it can be measured. Now the peculiarity of light is that it does not exist in a spatial system but in a region. The only contacts it has with a material system are at its source and at its locus of impact upon a material system. In between, it is only a series of spreading pulsations. It is not intrinsically "in space" or in a spatial frame.

But so indurate was the thought-form of the physicist that he just automatically applied to it his scheme of "in space", velocity in space, for example. In the old days light was given a sort of background—to use a *Gestaltist* phrase—against which it occurred. What I have in mind is the flat rejection of such a phrase as "the velocity of light *with respect to* the ether, or space, as a constant regardless of the source of light". But that was the fashion in which the Michelson-Morley experiment was interpreted. The purpose was to detect the motion of the earth with respect to ether and Absolute Space.

In short, I am arguing that the preconceptions are now outmoded, but that something of the thought-form still remains when people think of the velocity of light. They do not fully realize that velocity is a term which requires that light be put "in space", be given a frame of reference, that it does not intrinsically have such a frame since it is only an extensity-activity in a region.

So thought, light is an electro-magnetic activity spreading out from

a source over a region. Its constancy now becomes the unvarying nature of its pulsations as a series of activities or movements. There is no way in which it can be correlated with *ether* or *Space*. Here we have a clear case of the unobservables about which the positivists so bitterly complain. In my opinion they are not only unobservables; they are myths.

For mensurational purposes, a beam of light must, therefore, be given a frame of reference of a material sort. Only then is it "in space". The obvious frame is the source of light with distances in a material system measured out from it. Only then can we have the necessary context to obtain magnitudes such as *s* and *t*. The velocity of light is given by dividing the magnitude distance by the time-interval, *t*. As we have already noted, time-interval is not a thing in nature but a magnitude obtained by scientific technique. It is clear, therefore, that velocity is knowledge about the speed of light and that the phrase I have seen repeated *ad nauseam*, the velocity of light with respect to ether or Space, is very misleading.

It follows that this unvarying extensity-activity, when put in the material system offered by the source of light, will give a velocity as a scientific magnitude. And this velocity will give us knowledge about the unvarying speed of light in a region. So far as I can see, this velocity should be the same whenever so measured. There would be no reason for expecting it to vary from material system to material system. Hence a theory of light as a type of activity, or movement, having an intrinsic rhythm and extensity involves, when a material setting is given it, a kinematic relativity to a frame of reference built around the source of a light-beam. And this signifies the discarding of the phraseology, the velocity of light with respect to ether or Space. These are, as I have said, mythical entities.

It follows next that one should expect the non-interference recorded in the Michelson-Morley experiment and that the tumult was the result of false preconceptions and thought-forms. The light quite inevitably travelled equal distances at the same speed and with the same velocity.

But, historically, the effect was a puzzle and gave rise to artificial explanations. The Fitzgerald-Lorenz theory of the shortening of rods

in the direction of movement was one. And, so far as I can see, Einstein merely brought forward a clever Machian set-up and sidestepped the physical angle. If light moved in the ether or in Space, then the method of relative operational simultaneity could be used to account for number assignments. But did the rods shorten or not? Did the light travel equal distances? All that was left vague. It should be remembered that, in those days, Mach and Ostwald did not believe in atoms. The material universe was readily ignored.

As a physical realist this elegant positivistic procedure was not open to me. The result was that I have had to make an analysis of the whole situation and bring out the various meanings of terms.

Let me now ask this question, If the preconceptions had been different and the non-interference of light travelling equal distances in a material system been taken for granted, would all this pother about observers and operational simultaneity, this denial of absolute simultaneity, etc. have taken place? I doubt it. But this does not deny that it may have been technically useful in physics. In any case, if my analysis is correct, the theory of relativity has no ontological significance whatsoever. Materialism can live very happily with it as a device for physics.

For my analysis, any frame of reference for light, built around its source, is, physically interpreted, only one among many; for physical systems are in changing relations of movement and distance. It follows that there is no preferred frame and no preferred physical system. Note that ether and Space are renounced; and they would be the sole candidates. In place of Space, we should talk of the spatial characteristics of the material universe, including the region in which radiational activities occur. But more of that later.

Hence, we have an empirical justification of Einstein's stipulation that light be considered as traveling at the velocity of 186,000 miles per second for all frames of reference; only now it travels at this velocity for all physical systems with respect to the source of light in each system. As between physical systems moving with respect to one another there will be at least the Doppler effect. We shall consider later the conditions under which relative motion can be translated into absolute movement.

IV

But what is the theoretical import of this analysis? Clearly that it returns us the magnitudes obtained by measurement within each material system as absolute ratios under defined physical conditions. There is no good reason to suppose that the routines of nature vary from region to region just because material systems are in motion with respect to one another. Again, the mythology of an Absolute Time, containing uniform intervals, is removed; for it is realized that time-intervals are not entities in nature but cases of knowledge about durational processes, in terms of defined units, such as the ticking of calibrated clocks or the motion of the earth around the sun. Nevertheless, there is such a thing as absolute simultaneity for the whole universe; and it consists in the co-actuality of events. All actual changes in the universe are necessarily simultaneous.

However, the problem for science is the necessity for, and value of, the device set up by Einstein, once much of its motivation is taken away. I can put it this way: My analysis gives back the one material universe with both a spatial and a temporal unity, whereas the effect of the relativity theory was to break it up into frames of reference, each inhabited by an observer, much as the stars were, for Kepler, the domain of guardian spirits. The temptation was, thereupon, to relegate magnitudes obtained by measurement to the status of relative members, subordinate to the mathematical manipulation determined by relative, operational simultaneity. Note that I am not challenging the logic of the relativity scheme. All I am saying is that it merely generalized a cognitional construction. To this extent, it represented a movement away from realism and existentialism. Scientists were already befuddled epistemologically, as they were torn loose from seventeenth-century intuitionalistic rationalism—quite a timelag for these specialists. Nor was philosophy free from blame. *For cultural reasons* as well as technical ones, it was debating idealism and Humianism, with only scorn for a frank realistic materialism. In my opinion, it is time to get down to realities; and my recent articles have had that aim in mind.

I well remember how all the idealists, pragmatists, and positivists jubilantly perched on frames of reference having only in common

the invariant velocity of light. Quite a pluralistic set-up, relieved only by light-signals hurtling back and forth through what they called Space. All measurements suffered a sea-change and became *als ob*. When realists protested and pointed to paradoxes, they replied that magnitudes had now become numbers relative to an observer. And, of course, they were quite right. Twins did not get older differentially. And the reason was that the material universe had been left behind. Clocks did not wear out because they were ideal clocks. Twins did not grow old because they were symbols for number-assignments. Scientists did not bother their heads about it all, because they were primarily interested in numbers and equations and not in the proper conception of the material universe. The very development of physics into mathematical symbolization encouraged the perspective. And few Americans knew that Ernst Mach was back of the whole phenomenon. Recently, when I have explained some of my semantic distinctions to astronomers and mathematicians, it was evident that the distinction between knowledge and existence had little meaning for them. With a condescending smile they politely gave to philosophy this mysterious realm of existence by which I seemed to set such store. Numbers were their business and these involved space-time, that is, *s*-numbers and *t*-numbers.

My conclusion is that physics, as a science, must be judge of its own methods and concepts, but that it should not mistake knowledge for existence; and it should not be too certain that relativity theory has the backing which it would have *if it were the only way of explaining the zero result of the Michelson-Morley experiment.* Symbols need interpretation if they are to apply to the material universe; and if the symbols of physicists do not have such application, then you have the blissful autonomy of physics of which operationalists like Bridgman dream, a kind of isolationalism. As a fairly competent epistemologist, my suggestion is that physicists of this sort are just puzzled Humians. What the realist proposes as a desideratum is a philosophy of nature, backed by an adequate epistemology and ontology. The philosopher has his responsibilities in these cultural affairs. What I have been calling a reformed materialism is my candidate. It is my feeling that our culture needs to have its feet on the ground.

I have already pointed out that Einstein does not seem satisfied with positivism and enters a plea for "metaphysics". But the physical realist would prefer to return to the tradition of the Greeks for whom physics was concerned with a material universe. Of course, as De Sitter notes, Aristotle was just at the beginning of the great Greek scientific development. Hipparchus and Archimedes went far beyond him in astronomy and physics. It was with these that Galileo linked himself. I wish that scientists would stop using the word, metaphysics, for they seem to give it only a puzzled, emotional meaning. Ontology is a far better word.

In the same Schilpp volume, Russell straddles between materialism and Humianism in a typical fashion. Physics gives us our most verified knowledge. Therefore be materialists. But it is a materialism of space-time, of relativity. On the epistemological side he seems never to have studied referential critical realism with its distinction between sensing and perceiving. And I think I am justified in calling attention to the fact that I anticipated Russell's theory of the brain-consciousness situation in the chapter in *Critical Realism* (1916) called "Is Consciousness Alien to the Physical World?"

V

We have now at our disposal all the materials for a semantic analysis of the various meanings of the terms, space, time, in space, in time, motion and movement. Something of an historical context must be given for each meaning, especially for those outmoded.

Classical mechanics assumed that knowledge was a sort of rational intuition in which the essential nature of Absolute Space and Absolute Time was grasped. Euclidian geometry was supposed to be true in an absolute way and to give the principles applicable to Absolute Space. As yet, there was no distinction between pure and applied mathematics.

The result was that the expression, "bodies in space", tended to be interpreted quite literally as though bodies were in an empty receptacle called Space. And to say that events were "in time" meant likewise that they could be correlated with moments in an empty Absolute

the invariant velocity of light. Quite a pluralistic set-up, relieved only by light-signals hurtling back and forth through what they called Space. All measurements suffered a sea-change and became *als ob*. When realists protested and pointed to paradoxes, they replied that magnitudes had now become numbers relative to an observer. And, of course, they were quite right. Twins did not get older differentially. And the reason was that the material universe had been left behind. Clocks did not wear out because they were ideal clocks. Twins did not grow old because they were symbols for number-assignments. Scientists did not bother their heads about it all, because they were primarily interested in numbers and equations and not in the proper conception of the material universe. The very development of physics into mathematical symbolization encouraged the perspective. And few Americans knew that Ernst Mach was back of the whole phenomenon. Recently, when I have explained some of my semantic distinctions to astronomers and mathematicians, it was evident that the distinction between knowledge and existence had little meaning for them. With a condescending smile they politely gave to philosophy this mysterious realm of existence by which I seemed to set such store. Numbers were their business and these involved space-time, that is, *s*-numbers and *t*-numbers.

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The result was that the expression, "bodies in space", tended to be interpreted quite literally as though bodies were in an empty receptacle called Space. And to say that events were "in time" meant likewise that they could be correlated with moments in an empty Absolute

Time, flowing uniformly. Practical difficulties were recognized by Newton but the intellectual framework was of this sort.

It was inevitable that motion should follow suit. There could be an Absolute Motion set over against Space and Time. The question of Time seemed less puzzling just because Time seemed simpler in its nature. I shall show that Time is, if possible, more of an artifact than Space. Only change is the empirical basis. Intervals are achieved cases of knowledge in terms of measurement techniques.

In the centuries which succeeded, the struggle between rationalism and empiricism deepened in philosophy but seems to have had little effect upon physics and classical mechanics. It is true that Euler puzzled over epistemological difficulties under the impact of Berkeley. Kantianism was, as we see today, an impossible compromise. Unfortunately, no adequate form of physical realism was developed by philosophy.

Let us note next what was insidiously happening to mathematics in the meantime and, hence, to the meaning of the phrase, "in space".

As long as geometry had been purely Euclidian, it was natural for a rationalistic set-up like classical mechanics to assume that it dealt with Space as an external reality, having the characteristics of Euclidian geometry, and that the applicability of Euclidean geometry signified the existence of Absolute Space as a medium in which motion took place. And if Space, why not Time? And if Space and Time, why not Motion? These became three absolutes. There might, of course, be difficulty in detecting them. There was, as yet, no clear distinction between motion and movement, that is, relational change of neighborhood within a physical system. Newton himself was a little perplexed, as comes out in the famous case of the swirling pail of water.

With the growth of non-Euclidian geometry, the distinction between pure and applied geometry came increasingly to the front. The result was a gradual reformulation of the phrase, "in space". It was eventually realized that, for science, the phrase must mean "the applicability of a geometrical set of principles to the data of extensive measurement". But this realization came slowly and the old verbal habits lingered.

This prior mental habit clearly operated in the conception of ether,

in the nineteenth century. It was conceived as occupying Space and having properties which, unfortunately, were contradictory. I have already indicated the rôle of such preconceptions in the Michelson-Morley experiment. I find that scientists still tend to think of light-rays as "in Space" apart from the assignment of a frame of reference by which distances and time-intervals can be assigned. What Einstein did was to substitute a stipulational set-up without quite saying that he was disregarding the conception of light traveling in space. Much of the polemics was due to this evasion which reflected Mach and Avenarius. Lovejoy, for instance, was thinking about a material universe. The translation, into a universe of discourse, of observers and their calculations seemed a begging of the question—as, indeed, it was in some measure, as I have tried to show by giving a realistic solution of the Michelson-Morley experiment. What Einstein did was to define his terms in such a fashion that a kinematic set-up would involve certain number-assignments. It would be entirely reciprocal and it would all be a case of *als ob*. It is a kinematic device. Within the laboratory, measurements are actually made; but these are now tossed into the kinematic framework and so become relative to an observer. In themselves, they are absolute data with the time-interval now connected with the passage of light over a distance. Interpreted as relative to an observer, we now have the s and t numbers linked in terms of relative operational simultaneity. They lose their absoluteness. It is an elegant scheme. But the point is that, for the physical realist, it has little to do with the material universe. It is purely cognitional and developed on the assumption that it was necessitated by the Michelson-Morley experiment. We are told that only in this fashion can time be extended for physics throughout the universe. My query is, What do they mean by time? And why is time-dating so important for physics? Has physics suddenly become historical and curious as to what was going on in Sirius when Columbus was landing on the islands of the New World? I cannot help feeling that there has been a great deal of obfuscation.

VI

There are now several distinguishable meanings relevant to time. For the materialist, time implies, and is built around, the basic fact of

change. The actual state of affairs is alone actual, while the past has perished and the future is not yet actual. In short, the universe is a process. To the materialist this fact does not signify what it does to the idealist or the "reformed subjectivist". For a state of affairs is, for him, a condition of existing substances within intrinsically enduring being. His actual is no knife-edge. Moreover, the actual state of affairs is not a present, or now, of the same type as the past and the future. Past, present, and future are cognitional terms and set over against each other. What is the present? The present hour? The present year? The present century? No; one needs an ontological imagination in these matters and I have always written that real time is *in* the universe and not the universe in time. It is just the change characteristic of the material universe. I hope it can be seen why I hold that science has need for philosophy to offer it a good epistemology and an adequate ontology. Otherwise it becomes what the Thomists call *scientism,* rather bewildered, and yet arrogant because it knows that its methods alone gain verifiable facts. But what are they facts about?

Change as an absolute involves, as I have showed, absolute simultaneity, even apart from human knowledge as to what changes are simultaneous. But science wants the kind of knowledge it gets in measured time-intervals. To obtain these there must be a standard and methods of noting absolute simultaneities after a duration. Classical physics got this far.

Now the danger was to reify this abstraction and talk about Time as homogeneous, isotropic, etc. etc.; and to put events *into* this reified Time. This was, of course, conceptualizing; and very confusing semantically. Scientists asked themselves very gravely whether an event, *other physical conditions being the same,* would be affected by "the time of its occurrence". But such a time has meaning only for cognitional frames.

And then, with the ingenious postulates of Einstein, space-time was ushered on to the scene. Here, a time-interval is so obtained that the ticking of a clock—classical time-interval—is connected with the passage over a distance of light at an invariant velocity. And now, I suppose, scientists and positivists ask whether events are affected,

other things being equal, by their position in a space-time world line. Again, when there is no clear epistemology and ontology, nonsense so easily follows. Past, present, and future are often thought of as somehow coexisting timelessly. We are told that we dip into such a timeless time. Well the physical realist can only shrug his shoulders and say that there is need for a natural philosophy to replace Newton's and this phenomenalistic Frankenstein. I remember the period, when, surrounded by relativity enthusiasts, and the mystagogues of the Wittgenstein revelation I could only, like poor Galileo, murmur: "And yet there is a material universe and we are parts of it."

VII

Let us turn next to space and its various meanings. In many ways it is simpler than time.

There is, first, the empirical fact that things are extensive in three dimensions. When the constitution of a physical system is not undergoing change, the determinate extensities are characteristics of it. We think of such things as substantive and coexisting. So far as I can see, space is adjectival and has no existence apart from things in their relations. In other words, we should use the adjective, spatial, at the ontological level, just as we should use the words, temporal, or change, for time. Regions beyond massive material bodies are not Space; they are just regions or fields replete with radiational activities of many kinds.

Spatial things are "in space" when the extensities are measured to give magnitudes which can be handled by geometrical principles. They are in Euclidian space when the principles used are Euclidian. They are in Riemannian space when the principles used are Riemannian. But to ask whether the material universe is, in some ontological sense, in Euclidian Space or Riemannian Space is semantic nonsense. I suppose it is a hangover from Newton's Absolute Space as a receptacle.

And then we come to *space*-time. If my argument has been correct, all we have here are numbers relative to an observer in a frame of reference who can carry on his calculations of *als ob* on the basis of stipulations and relative operational simultaneity. One of my scien-

tific colleagues told me that the last edition of the *Encyclopedia Britannica* had no separate articles on space and time but only on space-time. In my opinion Homer has nodded. It's a scientific age, seemingly. A few minims of philosophy might help to give balance. Some people who have read Jeans and Eddington are hoping to wake up some morning and find themselves in Berkeley Square and far from Hitler. Well, it just won't do. We grow old absolutely and perish. We have cognitional, referential transcendence but no existential transcendence.

Let us now bring existential space and time together. Their existential togetherness consists in the fact that change takes place locally. There is no empty *Time ueberhaupt*. But this plural and local status of time does not signify that time and space are not distinct traits of existence.

VIII

Let me turn next to the distinction between motion and movement. Motion is a kinematic term and always involves a frame or background. Motion is cognitional and in respect to something else. It is a way in which movement appears. A ball tossed up from a bus seems to those on the bus to go up and come down; it is, as we say, part of that inertial system. To a person on the sidewalk it traverses a curve, And that is the way the movement *appears* to him.

We saw that scientists sought to give the unvarying extensive movement of light a frame of ether or Space and so think it as motion. I have argued that it was not necessary so to do. But to put it "in space" and measure its velocity it had to be connected up with a material system. Movement, then, is activity, process, change of neighborhood; motion is noted change of position with respect to some frame. It is that sort of knowing about movement. Movement is an absolute, like all change. Motion is relative to a frame.

In kinematics we deal with motion and not with movement. That is why Russell can facetiously assert that a train going from Edinburgh to London corresponds to London going to the train. Everything is reciprocal. In the relativity set-up we have pure reciprocity, for it deals with motion and not with movement. But we know empirically

why the train goes to London. It is because of the stoker and his burning coal. Causality comes into play. Wherever there is movement there causality is at work. We are in the material universe.

Now the interesting thing about astronomy is that scientists are pretty well limited to *motion*. Einstein recognizes this fact when he seeks to generalize the principle of relativity, which is kinematic. And he takes his departure from the well-established principle of the identity of inertial mass and gravitational mass. That light is affected by gravitation seems a verified empirical fact; and I do not see why it should surprise the physical realist. And I see no reason why Einstein's equations should not be more adequate to the universe as we know it today than Newton's simpler formula. But to talk about Space as being distorted in the neighborhood of large material masses is, of course, merely a way of speaking. What we seem to have is a gravitational field. The scientific problem is to put it "in space", that is, to handle behavior in it in a mathematical fashion. I shall have something more to say about the difference between motion and movement when I come to touch briefly upon the "expanding universe" conception.

I have argued that wherever there is motion there is movement, that is, causal activity, even if we cannot locate its basis. In other words, a set of frames in relative motion *entails* a case of actual movement in the universe, that is, some change of neighborhood. On this earth we usually have an idea of the energy changes involved. When the scale is cosmic we get confused as between motion (knowledge) and movement (activity). Motion with respect to the stars is not the same as movement which involves something dynamic and situational. While the universe as a whole (if such a statement is meaningful) cannot be in either motion or movement with respect to, or in changing relations to, something external to it, a body like the earth can be in both motion and movement. All movement is absolute, relational and dynamic. It can be kinematically *described* as motion with respect to a frame of reference.

I should like, now, to raise some questions with respect to the precise meaning to be given certain terms in physics if we are to work in the direction of a philosophy of nature.

I take it that terms like atoms, electrons, protons, neutrons, photons are denotative symbols which, in intention, designate *forms of being.* My ontology postulates an intrinsic endurance of being, that is, that it does not use itself up. I take it that this basic trait manifests itself in what is called the conservation of energy, where energy is a symbolic quantity connected with the capacity to perform work. Energy must be regarded as a case of knowledge about being. I judge by my slight knowledge of thermodynamics that it is very general knowledge. And I may say that I am very sceptical of the extrapolation of entropy to the universe as a whole. Eddington may talk about putting away a few conceptions, but a physical realist cannot treat such topics as absolute origins and final states so cavalierly. To him, with his conception of ontological time as change in the universe, absolute origin and end have no meaning; as well talk to a theist about the origin and end of God.

A few words about mass are also in order. It is clear that mass is a factor of proportionality measured in connection with momentum and velocity. It is a quantity; therefore, a case of knowledge. In classical physics it was regarded as a measure of a property called inertia. Now, once we give up intuitionalistic rationalism, we are aware that inertia can only be an instance of abstract knowledge about a material system. So far as I can see, it concerns knowledge about causal behavior. This type of behavior is indistinguishable from gravitational behavior. We should, I suppose, give up any notion of "right lines" as *natural lines.* Otherwise there would not be much of an advance upon the Greeks with their natural circular motion. Right, or straight, lines is, clearly, an abstract kinematic conception. In nature itself there are only movements which are always situational. It is, then, a question of how these should be put descriptively into space.

IX

As I have constantly emphasized, the postulates of relativity appear to me logically consistent and they seem to be of value to physics, interested, as it is, in the correlation of magnitudes. The very fact that it has helped to free physicists from mechanical pictures has not been without its usefulness. Mass as a magnitude could be correlated

with energy, for instance. But it is my conviction that the way it was presented was often misleading. The denial of absolute simultaneity implied a kind of operational pluralism. It was as though frames of reference constituted island universes. The very phenomenalism of the approach weakened the distinction between material systems in movement-relations with one another, and a mathematical projection of frames and observers upon these material systems. And because there was no clear theory of knowledge and ontology, the distinction between knowledge and existence was seldom sharply enough drawn. It is my hope that the semantic contrasts I have developed may clarify the situation.

I have put chief stress upon a conception of absolute simultaneity independent of Newtonian rationalism. But it seems to me that determinate location in the material universe must also be accepted. Thus to say that the material universe is spatial is more accurate than to say that it is "in space". Physically, therefore, two beams of electrons shot out in opposite directions should reach material bodies at equal distances, and together cover a region double that which one of them covers. Here we would have two cases of physical movement. And as motion with respect to the earth, each would, of course, be handled separately and assigned its velocity. But would velocity with respect to one another be meaningful? If the one is taken as a frame, then the other cannot be given a velocity of removal as great as that of light, for the velocity of light is the maximum. At the same time we are empirically aware that a sphere of optical activity spreading out from the center whence the two beams of electrons took their departure would keep ahead of both beams. And I suppose this contrast must signify that the kinematic set-up with its so-called "ageless" beam of light is postulational. Actual light, as we have argued, has a source and its velocity should be measured with respect to that source. Two material systems moving with respect to one another could not have quite the same beam of light, for what would be source for one would be effect for the other and the Doppler shift should occur. But then the two frames of reference become material systems in the same universe.

I have said little about the twins, for this paradox follows from the

confusion of a kinematic set-up and material systems. I take it that, in both material systems, events would be proceeding much as usual. People would be growing older and clocks would be wearing out. Relativity assignments are affairs of *als ob,* of *knowledge,* within certain assumptions, rather than of existence.

If, then, my solution of the Michelson-Morley experiment is correct, relativity must be judged only in terms of its usefulness for physics. It has no literal significance for the material universe. It is primarily a mensurational scheme.

X

In conclusion I am going to permit myself some suggestions with regard to cosmology and the expanding universe:

1. All stars and nebulae are material systems in absolute movement in their distance relations. It is a dynamic universe.

2. From the standpoint of motion any one star can be selected as a kinematic frame for motion. Other stars will then appear as in motion with respect to it though the facts of absolute relational movement cannot be discovered. I take ours to be a circulating universe.

3. Since there is no center to the universe of a static sort and all the stars are in relational movement, the kinematic effect will be that of an expanding universe.

4. The farther the stars are away, the greater will appear to be the motion. This is because movement is additive as it appears as motion. The order will be 1, 2, 3, 4, etc. Suppose a star is in movement in its relations with the sun, then the next farther star, just not to move but to keep its distance would have to be assigned the same motion. Otherwise we would have a contracting universe. But the first star has no preferential status. Therefore the second star is also in movement, which gives two units for it as against one unit for the first star. The third star must keep up to the second in order not to have a contracting universe and its movement leads to three units; and so on. I take it that a circulating universe would appear kinematically as an expanding universe. If light loses its energy over immense distances, that would be a conflicting factor.

5. The universe cannot be in movement as a whole because it has no environment with which to change its neighborhood. Nor can it be described as in motion for there is no assignable external frame.

6. I take it that the universe is finite and that it has an internal dynamic equilibrium. I am sceptical of the time-arrow of entropy for the universe as a whole. Dynamic being causally integrates existents which have emergent properties but only secondary endurance, the endurance of processes.

In some such direction, it seems to me, the adjustment between relativity theory and materialism must be looked for. I see no empirical reason to believe in shortened rods or actually slowing clocks. Give up the preconceptions of the old physics and such theories are unneeded. But Einstein's device must then secure another justification, which may well be its calculative value. To add to clock intervals a *new* interval in which this one is united with the passage of light at an invariant velocity makes possible the use of C as a constant in formulae. The value of this factor must be judged by the physicist. But, once the distinction between knowledge and existence is cleared up and the various meanings of space and time separated, no confusion should result. It is my belief that realistic philosophers should cooperate with scientists in working out a "natural philosophy" continuous with that of the great Greek scientists. Modern physics was long overweighted on the side of rationalism, contrary to ordinary belief, and the development of mathematical physics has revivified this tendency, as can be seen in Eddington and Milne. What I have tried to contribute is philosophical analysis. Needless to say, I have nothing but admiration for Einstein as both man and thinker. But his philosophical affiliations seem to be those of Mach and Kant. Reformed materialism must distinguish, while correlating, the categories of knowledge, *s* and *t*, and the categories of ontology or physical existence. I take existence to be simpler in its methods than human symbolic, mensurational, operational and predictive knowledge.

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ETHICS AND PHYSICS IN DEMOCRITUS

(Part Two)

VI. MAN MAKES HIMSELF

IT MAY seem strange to us that Democritean cosmology should include a chapter on the origins of civilization.[1] It did not seem so to the Ionians. Thus Anaxagoras' fr. 4 assumes as a matter of course that civilization is a cosmic episode: the works of man (πόλεις, ἔργα, οἰκήσεις) are implicit (ἐνεῖναι) in the original "mixture"; they are the physical consequence of the cosmogonic "separation".[2] Yet it is one thing to conceive of man and his arts as the creation of nature; it is quite another to purge one's own mind completely of the traditional, anthropocentric world-view. Anaxagoras gives himself away in this fragment with the assumption that each "separation" is bound to produce men, and that "these will have a sun and a moon and the rest as with us".[3] Democritus' doctrine that "some worlds are without any sun or moon . . . and some are without any living creatures" (Hipp. *Ref.* 1.13.3; A. 40) looks like a conscious repudiation of the teleological streak in

[1] See the material collected by Diels under B. 5; and my paper, "On the Pre-History in Diodorus", which is to appear shortly in the *American Journal of Philology.*

[2] The conflict of *physis* and *nomos* is not a symptom of the dissociation of man from nature, but the reverse. Archelaus, whose cosmology also carried over into pre-history (A. 4), taught that our ideas of what is just and base are not φύσει but νόμῳ (A. 1, and A. 2).

[3] Uxkull's valuable study *Griechische Kultur-Enstehungslehren*, 10 f. outstrips the evidence on this point, making Anaxagoras the philosophical source of the anthropocentric theory of culture in the fifth century. Between Anaxagoras and the simple piety of Xenophon's *Mem.* iv. 3, a great gulf is fixed. Socrates' yearnings for a teleological universe found slim comfort in Anaxagoras. It seems more consistent with the evidence to acknowledge the conflict between teleology and mechanism in Anaxagoras' thought, with mechanism dominating the actual working out of the system.

Anaxagorean physics. Schooled to "refer to necessity all things which nature employs" (Arist., *de gen. an.* 789b 4), Democritus could assimilate the origins of human culture to the same methodology. The result was a profound imaginative innovation. *Anankē*, which figured in Aeschylus, not only as alien to *technē*, but as its obdurate, invincible opponent,[4] now displaces Prometheus himself as the progenitor of *technē*. Democritus' phrase, "necessity separated them out (sc. the arts)" (B. 144), follows Anaxagoras in thinking of the event in terms of the cosmogonic "separation". But adding "necessity" (τἀναγκαῖον) he carries the logic of the Ionian position to its ultimate necessitarian conclusion.

2. Just how did Democritus think of necessity "separating out" the arts? For the general outlines of his answer we can only look to the Hecataean fragment in Diodorus I.8. There "need" or "necessity" are man's "teachers".[5] Struggling to survive against hostile forces in his environment,[6] man is compelled to associate himself with other men; hence speech (I.8.3,4). He is also compelled to learn from experience (πεῖρα, I.8.7); hence the mechanical arts.[7] These "discoveries" (εὑρήματα) change not only external arrangements, but his very life (βίος).[8] And since we know that

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[4] *Pr. V.*, 514, τέχνη δ' ἀνάγκης ἀσθενεστέρα μακρῷ.

[5] Diod. I.8.7., καθόλου γὰρ πάντων τὴν χρείαν αὐτὴν διδάσκαλον γενέσθαι τοῖς ἀνθρώποις. As for τὴν ἀνάγκην σχόντες διδάσκαλον, it occurs in the Tzetzes excerpt (Diels-Kranz, II, 138, line 1) which is even less reliable as a source than Diodorus; however, the term ἀνάγκη, matching τἀναγκαῖον in B. 144, may safely be accepted as genuine. Cf. *On Anc. Med.*, c. 3, where ἀνάγκη and χρείη are used interchangeably as mainsprings of progress in the medical arts.

[6] Beasts of prey the year round, cold and food-shortage in the winter (I.8.2 and 6).

[7] Aelian N. H. 12.6 (A. 151), in his account of the discovery of the mule, gives an illustration of what Democritus meant by "learning from experience":

(a) something happens "by chance" (*i.e.*, by necessary forces beyond human control);

(b) men observe how it happened;

(c) they can then convert "chance" into "custom" (συνήθεια). This must be the general pattern according to which men are "taught" by nature (cf. μαθητάς here with B. 154. See also below, note 16.) But to complete the pattern we should add

(d) man's own "need" which sensitizes him to the value of a useful sequence when he runs into it. (Cf. the account of the origin of fire in Diod. I.13.3 with Lucr. V, 1091 f. Lucretius simply describes the natural means by which the fire was produced. Diodorus, whose Hecataean source may reflect Democritean ideas, dwells on the connection of the event with human need and on the human means by which the physical event was appropriated.)

[8] Pre-civilized life was less than human, ("disorderly", "beastly", "solitary": Diod. I.8.1).

Democritus thinks of "life" as dependent upon the form of the soul (B. 61), the change goes further still: it is tantamount to a transformation of the soul. The nature of the soul is not fixed by the original pattern of the soul-atoms. This pattern itself can be changed: "Teaching (*διδαχή*) re-forms (*μεταρυσμοῖ*) a man, and by re-forming, makes his nature (*φυσιοποιεῖ*)" (B. 33, Bailey's tr.). Both verbs in this sentence deserve close attention:

(a) *Metarysmoi* (matched by the equivalent term *ἀμειψιρυσμεῖν*)[9] must refer to a change in the ultimate physical *rysmos* (configuration) of the soul-atoms.[10]

(b) *Physiopoiei*, unique in Greek literature, suggests the force with which Democritus grasped the idea of "human nature in the making".

3. To be sure, the concept of nature as itself the product of teaching and custom is not unique in Democritus. It is the common property of the age. For the sophist it provides an *apologia pro arte sua*. For the medical man it expresses a norm of "nature" which takes into account not merely anatomical structure but also the patient's established habits and mode of life.[11] Yet philosophical originality lies not so much in novelty, as in powerful generalizaton and fruitful interrelation of ideas. This Democritus did with his

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[9] *Ἀμειψιρυσμίη* is defined in Hesychius' dictionary as *ἀλλάσσειν τὴν σύγκρισιν ἢ μεταμορφοῦσθαι* (B. 139), and it is matched in turn by *ἀμειψικοσμίη* (B. 138). That this concerns an important part of Democritean thought is clear from the title of two treatises, *Περὶ Ἀμειψιρυσμιῶν* (B. 8a) and *Περὶ Διαφερόντων Ρυσμῶν* (B. 5i), both classed by Thrasyllus under *Φυσικά*.

[10] *Διαθιγή* and *τρόπος* which, with *ρυσμός*, explain all qualitative differences in atomic physics (Arist., *Metaph.* 985 15 f.), turn up in various compounds in ethical fragments:

(a) *Εὐτροπίη* in B. 57, where *ἡ τοῦ ἤθεος εὐτροπίη* is used as the broadest possible description of *human* virtue to balance "bodily strength" in animals. Again, *τρόπος εὔτακτος* is used of the inner order of the soul which determines the order of man's outward life (B. 61).

(b) *κακοθιγίη*, Diels' conjectural reading in B. 223, if correct, would be the ethical counterpart of (bad) atomic *διαθιγή*, which I interpret following Beare (*op. cit.*, 37, n. 2), "Probably *διαθῑγή* is dialectic = *διαθήκη*, *i.e.*, *διάθεσις* and not = 'contact' ($\sqrt{\text{-}\theta\bar{\imath}\gamma\text{-}}$)."

[11] *Διδαχὴ φυσιοποιός* is closely paralleled by *μάθησις ἐμφυσιωθεῖσα* in the Hippocratean *Nomos*, 2. *On Airs, Waters*, etc., 14, explaining longheadedness as a result of shaping artificially the head: the work of *νόμος* becomes *φύσις* with the passage of time. Even more striking is the use of such terms as the following in diagnosis: *τὸ σύνηθες*, *Prognostic*, 3.19 and 3.25; *τὸ ἔθος*, *On Anc. Med.*, 10; *τὸ μεμαθηκός*, *ibid.*, and also in *On Diet in Acute Illness*, 28.

concept of "teaching that makes nature", turning it into a nest of interconnections between physics and ethics:

(i) "Teaching" frees man not from necessity (which is absolutely impossible) but from chance (which is largely possible);

(ii) "Teaching" can be directed not only outwards, upon external nature, but also inwards, to attack the salient which chance holds within man's own nature—sensation and pleasure;

(iii) The combined effect of (i) and (ii) is the use of man's own proper power to increase that power and thus advance his self-sufficiency.

4. So much talk of chance in the ethical fragments seems "odd" to Cyril Bailey: "there is here a striking contrast to the suppression of the idea of chance in the physical theory and it seems to show that Democritus' ethics are largely independent of his physics" (*op. cit.*, 188). But chance is not only consistent with physics (Bailey says, "not necessarily inconsistent", 187); it can only be correctly explained through the physics. It enjoys the same kind of status as, *e.g.*, color:[12] Neither exists absolutely in the atoms themselves. Both exist in relation to our own sentience or action—and this not in spite of atomic law, but because of it. As the author of *On Nutriment* speaks of "spontaneous" organic processes, "spontaneous with regard to us, but not spontaneous with regard to the cause",[13] so Democritus speaks of "chance" events. Ignoring this distinction, "bastard knowledge" attributes color and chance absolutely to being. In the case of chance this is more than error; it is 'rationalization'. The fiction of chance excuses, and therefore confirms, our own stupidity and helplessness (*πρόφασις ἰδίης ἀβουλίης*, B. 119). Thus the misunderstanding of the relative reality of chance means an absolute reduction in our own natural power. Hence Democritus' preoccupation with chance in the ethics. It is no mere matter of linguistics to be settled in a semantic footnote.

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[12] Arist., *de gen. et cor.* 316a 1, "he denies the being of color; things get colored by configuration (*τροπῇ*)".

[13] c.14. Cf. also *On Anc. Med.*, 9, *καθαιρόμενοι, ἢ αὐτόματοι ἢ ἀπὸ φαρμάκου.* In general "chance" in Hippocratean literature refers to anything that happens in default of art, especially medical art; thus, *On Anc. Med.*, 1, *τύχῃ δ' ἂν πάντα τῶν καμνόντων διοικεῖτο* (*i.e.*, before the discovery of medicine); and *ibid.*, 12, *ὡς καλῶς καὶ ὀρθῶς ἐξεύρηνται καὶ οὐκ ἀπὸ τύχης.*

It is a moral encounter with the competitor and opponent of "teaching", that has power to change human nature after its own pattern: "The stupid are formed (*ρυσμοῦνται*)[14] by the gains of chance; but those who understand these things (are formed) by (the gains of) wisdom" (B. 197).

5. We can now integrate this notion of chance with that distinction between crude and enlightened sensation, between questionable and sound pleasure, which is at the heart of Democritean epistemology and ethics (Part One, III, 7). This change in our *rysmos* for whose control "teaching" contends with "chance" occurs to a lesser, but equally definite, extent with the impact of every incoming stimulus upon our senses. Every perception is such an impact (B. 9); and when knowledge is nothing more than the cumulative sequence of such external impacts—and in that sense the child of chance—then it is "bastard knowledge". Only when fathered upon our senses by the soul's inherent power to move itself in the "subtler" inquiry of reason, is it "genuine knowledge". This interpretation, of course, is pure reconstruction. There is no evidence in the sources that Democritus so applied the notion of chance to his theory of knowledge, though it is so applicable. But we know that he applied it in ethics through the cognate notion of teaching, "hard work" (*πόνος*):[15] "Learning (*μάθησις*)[16] achieves good things through hard work; but bad things grow spontaneously without hard work" (B. 182). So too B. 178 tells us why "indulgence" (*εὐπετείη*, the negation of hard work) is the "worst possible thing": for this is what gives birth to "those pleasures, from which badness comes into being".

6. Here is a more powerful idea than the notion of "overcoming"

[14] The verb *ρυσμόω* here is apparently the only instance of its kind, apart from one other in the late writer, Symmachus. As in *μεταρυσμεῖν*, Democritus must be thinking of the basic *ρυσμός* of the soul-atoms.

[15] Two things are worth noting about *πόνος* in Democritus:

(i) It is the process by which art itself is appropriated: B. 59, *τέχνη* and *σοφίη* are achieved only through *μάθησις*; B. 182, . . . *τοῖς πόνοις ἡ μάθησις ἐξεργάζεται*; and B. 157, *τὴν πολιτικὴν τέχνην ἐκδιδάσκεσθαι καὶ τοὺς πόνους διώκειν*.

(ii) It covers the whole area, physical and spiritual, which science wrests from chance. See B. 179, which brings explicitly under *πονεῖν* athletic excellence, letters, music, and, most important of all, "reverence" (*αἰδώς*). B. 157 brings in also political skill under *πόνοι*.

[16] Cf. *μάθησις* in A. 151, B. 254, and B. 59; also in Diod. 1.8.7.

pleasure.[17] It is particularly important for Democritus' hygienic conception of pleasure. For it clearly thinks of pleasure as the creature, not the creator, of the good life. "Badness" does not come from pleasure as such (any more than drunkenness, etc. come from the body, cf. above Part One, I,4). The pleasures from which it comes are not given in human nature as such; they are formed in human nature through the soul's failure to make for itself a nobler pattern of pleasure:

B. 189: "It is best for man to lead his life with the maximum of pleasure and the minimum of grief. This would come about if he would not *make his pleasure* in mortal things" (*μὴ ἐπὶ τοῖς θνητοῖσι τὰς ἡδονὰς ποιοῖτο*).

B. 235: "Those who *take their pleasures* from the belly (*ἀπὸ γαστρὸς τας ἡδονὰς ποιέονται*)" . . .

The locus of pleasure is thus not decided for us by our 'given' constitution. There is the body, to be sure, with its relatively fixed loci of pleasure. But the soul retains the power to integrate these as subordinate parts of a larger pattern of pleasure which is decisive for its happiness. Failing to use this power it will have to fall back on the pleasures of the belly, will demand more of these pleasures than they can give within the law of the limit, will therefore overstep the limit and pay for it in pain.

7. But would not the life of "hard work"—with its double association of exercise and painful exertion[18]—be the negation of pleasure and thus the wedge that pries "well-being" loose from "cheerfulness"? There are four considerations in Democritus to meet this:

(i) In the absence of hard work, pleasures (as we have seen) would "grow wild", and the short-lived ones that are followed by pain would luxuriate (So B. 235; cf. also B. 242);

(ii) "Continuous hard work grows ever lighter through habituation" (B. 241).

(iii) Achievement makes hard work more pleasant than even

[17] B. 214, *ὁ τῶν ἡδονῶν κρείσσων vs.* those who *γυναιξὶ δουλεύουσιν*. The same idea in Gorg. B. 11a (15), *οἱ κρείττονες τῶν τῆς φύσεως ἡδονῶν vs. οἱ δουλεύοντες ταῖς ἡδοναῖς*, and in Antiphon, the sophist, who presents most sharply the underlying idea of self-mastery: *αὐτὸς ἑωυτὸν κρατέειν* (B. 58) and *κρατήσας αὐτὸς ἑωυτὸν κόσμιον παρέχεται* (B 59).

[18] So in Hippocr. lit. See Littré's Index under "Exercice" and "Peine". Its most common meaning elsewhere is most nearly rendered in English by "hard work" (*e.g.*, Xenophanes B. 25, Antiphon B. 49, Epicharmus B. 36).

rest would be. Only when unsuccessful is hard work "annoying and miserable" (B. 242).

(iv) In any case, the life of hard work guarantees, as haphazard living never can, the essential condition of "cheerfulness" and "well-being": self-sufficiency (αὐτάρκεια). "Chance is a giver of great gifts, but uncertain. Nature is self-sufficient" (B. 176). "Chance spreads before us a lavish banquet, but moderation a self-sufficient one" (B. 210).

8. In this first encounter with the concept of self-sufficiency we should note its ambivalence: It may mean the deflation of desire and curtailment of enterprise to forestall any collision with the impossible; or else it may mean the resourceful extension of skill, enlargement of purpose, enhancement of power through the better understanding of the possible. The two moods are not incompatible. They can blend under the dominance of the second to produce a confident, adventurous, experimental attitude towards life. But if the balance tilts in favor of the first, self-sufficiency becomes the maxim of an introverted quest for security, seeking peace of mind through the inhibition rather than the extension of action. So we may see it in Democritus' own social ethic.[19] But this is not the form in which it appears in the present context. "Nature is self-sufficient" here has much the same sense as the medical rule that the state of "balance" is "most self-sufficient":[20] self-sufficiency is the power of self-maintenance given to the healthy creature in its very nature. Nature *is* this power of self-maintenance;[21] hence the expression "one's own power and nature", as we find it both in Democritus and in the medical literature.[22] As such, nature defines

[19] In general, wherever self-sufficiency appears in the context of social relations the mood 'be content with what you have, don't ask for more' predominates in Democritus. So, for example, in B. 191. Langerbeck's interpretation is too one-sided to admit this (*op. cit.*, 59). It is true that ἀρκέεσθαι *may* mean "Nicht-beduerfen", not "Sich begnuegen". But what else than "Sich begnuegen" is there in "comparing your own life with that of those who are worse off and congratulating yourself at the thought of their misfortunes" (B. 191)? This fragment drifts into this mood precisely when it passes from the physical basis of "cheerfulness" to the social context.

[20] *On Diet*, I, 35, κρῆσις αὐταρκέστατον. Cf. Thuc. 2.51.3, no one's physique proved self-sufficient (αὔταρκες), *i.e.*, strong enough to resist the disease.

[21] For a quaint instance of nature as αὐτάρκης because of its power of self-help, see Aeschylus, *Choe.* 757, νέα δὲ νηδὺς αὐτάρκης τέκνων.

[22] Cf. τὴν δύναμιν ἑωυτοῦ καὶ τὴν φύσιν in B. 3, with τὴν τοῦ ἀνθρώπου φύσιν τε καὶ δύναμιν in *On Anc. Med.*, 3; ἕκαστον ἔχει (sc. the four humours) δύναμίν τε καὶ φύσιν

an order of what is "possible" and "impossible".[23] But man's nature is not fixed; as Heracleitus thought of man, he is a "self-increasing *logos*" (B. 115). Through "teaching" he can make his own nature, and has been making it ever since he was first taught by necessity to turn necessity, through "art", into the ally of his power. There is nothing in the concept of self-sufficiency as such to negate this dynamic view of human nature. There is simply the reminder that this development can proceed only within the limits of the "possible". Nature is self-sufficient because it never oversteps those limits. Neither must "teaching", if it is to be the "teaching that makes nature". Contrariwise, attempting the impossible, it would prove the undoing of art, and thus submission to chance.

V. THEORY AND PRACTICE

1. The contrast of "deed" (ἔργον) and *logos*, so familiar, even commonplace, in fifth-century literature, can now find its proper place in Democritus' system.[24] *Logos* is morally important only in so far as it is "teaching that makes nature" and thus affects action.[25] This is no platitude if we think of it against the sophist's glib claims for the power of his *logos* to produce right action.[26] Democritus counters with, "many who have never learned *logos* live in accordance with *logos*" (B. 53), while "many practice the noblest *logoi* while doing the basest deeds" (B. 53a). The tone of the argument grows sharper with B. 82, "those who do everything in *logos*, nothing in action, are fakes; they have only the semblance of truth" (ἀληθοφανέες), and B. 145, "*logos* is but the shadow of the deed". Such sayings, incidentally, also distinguish Democritus from his paradoxical allies in the battle against Protagoras. Socra-

τὴν ἑωυτοῦ in *On Nature of Man*, 5; and φύσιν δὲ ἕκαστον (sc. νόσημα) ἔχει καὶ δύναμιν ἐφ' ἑωυτοῦ in *On Sacr. Dis.*, 21.

[23] δυνατά, B. 191; ἐφικτά, B. 58 and 59; ἀδύνατα, B. 58.

[24] Prior to the fifth century not the contrast but the unity of thought and deed is uppermost. In the epic and the lyric knowledge is practical; to know is to know how; wisdom is skill in action and therefore power to act. Heracleitus, the first of the philosophers to turn to this theme, assumes as a matter of course that *logos* and *sophiē* carry the double reference of true word (and thought) and right deed B. 112; cf. B. 1). See Jaeger, *Paideia*, I, 180.

[25] Normally this would involve much more than talk; cf. the concept of πόνος, above IV, 6–8). Other fragments on *paideia* set example above precept (B. 208) and recommend the *mimēsis* of the good man (B. 39; cf. B. 79).

[26] *E.g.*, Plato, *Prot.* 318a.

tes and Plato would level the charge of ἀληθοφάνεια directly against the *logos* of the sophist. It is characteristic of Democritus that he should find in the deed the touchstone of sophistic unreality.

2. But neither does Democritus underrate the distinctively psychic function of intention and wish:

B. 68: "The trustworthy and untrustworthy man (δόκιμος, ἀδόκιμος) is to be known not only from what he does, but also from what he wants."

B. 62: "It is not the absence of injustice that is good, but the absence of the desire (to commit injustice)."

B. 89: "Not he who wrongs you, but he who wants to wrong you, is the enemy."

One should not interpret such sayings as a retreat in the direction of subjectivism. Why should a man of action underestimate the importance of intention for action? Thus a speaker in Thucydides (VI.38.4) remarks: "One must take defensive measures not only against what the enemy does, but also against what is in his mind."[27] In a philosophy where soul moves body the emphasis would naturally fall on the doings of the soul even when (or, rather, especially when) these are incompletely revealed in the body's outward motion. For here are the springs of action and, sooner or later, the real intention of the soul becomes the body's deed.[28]

3. There follows a concept of "wisdom" (σοφίη) which is practical in the most urgent sense and is *therefore* broad enough to order both the outward life (βίος) and the inner "form" (τρόπος) which determines the life (B. 61; cf. above IV, note 10). "Wisdom" is the understanding of what is possible within the limits of what is necessary. It is, therefore, in the first place a shrewd, sharp-eyed knowledge of affairs (εὐξύνετος ὀξυδερκείη) which can "direct most things in life" (B. 119). It is the Ulysses-like resourcefulness, rarely baffled by chance, whose inventions snatch use and benefit (τὸ χρήσιμον, τἀγαθά) from the very teeth of external evil and danger (B. 172; cf. above II, 6 and IV, 2). It is the prognosis of events without which the stupid can only learn "the hard way".[29]

[27] Exactly as in Democritus, B. 193, "it is the job of intelligence to guard against impending injustice".

[28] I say "real intention" with B. 81 in mind, "to be ever intending (μέλλειν) makes action incomplete". In the last resort only action can sift out real intention from velleity. For the word-deed contrast to express the parallel distinction of true *vs.* specious intent, cf. Herod. VII.155.

[29] Cf. the force of προβουλεύεσθαι as *vs.* μετανοεῖν in B. 66. For the "stupid" see

4. And for this very reason wisdom can serve as an inner discipline. By discerning the limits within which the external world can be changed, the wise soul changes itself, educating desire and making hope itself reasonable.[30] Without this process of reconciliation with reality there is no "cheerfulness", as one can see from what happens to the "stupid", who "live but get no enjoyment from life".[31] Why not?

(i) Their battle against necessity is necessarily self-defeating. Fleeing the inescapable—*e.g.*, old age, and death—all their efforts bring them, like Oedipus, nearer the fateful end (B. 203, B. 205).

(ii) A mirage robs them of satisfaction from the perfectly satisfying things that come their way. "The desire for more loses what is in hand: it is like the dog in Aesop" (B. 224; cf. B. 202). Often enough Democritus illustrates this with commonplace exhortations to be content with what one has. But he is also capable of applying the underlying idea with astonishing subtlety and depth: "the stupid, hating life, want to live for fear of Hades" (B. 199). Instead of enjoying life for what it is, they hate it for what it is not, the prelude to Hades; so they want to prolong the life they hate, in order to postpone death. It would be hard to find a better example of man being his own worst enemy through stupid disregard of the limit.[32]

CONCLUSION

At the risk of repetition, I add (a) a list of the concepts which mark the main junctions between ethics and physics, and (b) a more general interpretation of the historic importance of Democritean ethics, as the first rigorously naturalistic ethics in Greek thought.

B. 54 and B. 76; and cf. Hesiod, *Op.* 218, "the stupid learns through suffering", as well as the theme of *πάθει μάθος* in Aeschylus.

[30] Cf. B. 185, . . . *αἱ τῶν πεπαιδευμένων ἐλπίδες*, and B. 292, *ἄλογοι τῶν ἀξυνέτων αἱ ἐλπίδες*. 'Rational' here does not mean, as in Plato, 'in agreement with an ideal standard' but simply 'realisable within the order of nature' (Cf. B. 58, *ἐλπίδες . . . ἐφικταί, . . . ἀδύνατοι.*)

[31] B. 200. The same thought in even stronger form in B. 204, if the Ms reading be retained.

[32] B. 294–296 shows how "wisdom" deals with an inescapable thing like old age. It takes a grimly realistic view of its losses (B. 296), yet balances them (B. 294, 295) by a clear sense of the complete (*τέλειον*) good that comes only with old age. *Σωφροσύνη* is finely described as the "flower" of withered age.

(a) *The Leading Concepts*

(i) The soul: a specific atomic cluster, dependent for its integrity upon another cluster (the body), and having the power to move the latter. This determines an ethic which is soul-centered, but free from dualism.

(ii) The "divine": any natural entity whose moral value is not less than that traditionally attached to supernatural entities of popular religion. In this sense the soul, though mortal, is divine.

(iii) "Well-being": the physical and moral state of the "cheerful" soul. It is defined positively as healthful balance (κρῆσις), negatively as the absence of violent motion.

(iv) Pleasure: the "appearance" of "well-being"; therefore, to be pursued only in accordance with "what agrees with" (συμφέρειν) the soul's well-being.

(v) "Art": the soul's power to change nature. Discovered under pressure of "necessity", it can operate within the limits fixed by necessity to advance man's "power" (δύναμις) and "self-sufficiency".

(vi) "Chance": events uncontrolled by art.

(vii) "Teaching" (διδαχή) and "hard work" (πόνος): the directed change of the soul's inner nature. Such moral change has physical effect, since it alters the pattern (ρυσμός) of the soul-cluster.

(viii) The deed (ἔργον): the moral (and physical) motion within which the good is realised. *Logos* exists for the sake of the deed.

(ix) Wisdom (σοφίη): insight into the order of nature which enables the soul to direct both external forces and its own inner motions of desire and hope.

(b) *Democritus' Naturalistic Ethics*

When Anaximander spoke of nature as an order of "justice", he did more than eke out with political metaphor the archaic vocabulary of his physics. Consciously or not, he grounded justice in a realm as immortal and indestructible as the traditional gods, but fully intelligible to man. In Heracleitus nature consciously takes the place of Olympus as the matrix of law, justice, measure, and *logos*. It is itself the "nutriment", the "common" basis and guide of all human action, public and private. Nature so regarded is more than nature. Justice is naturalized by moralizing nature.

Parmenides and Empedocles continue in this path. It is "justice" that holds Parmenides' Being within "the bonds of the measure"; and the moral axioms of the democratic polis determine the design of Empedocles' equalitarian universe.[33]

The atoms and the void destroy forever this Greek venture in romantic naturalism. Nature is now de-humanized, de-moralized as never before in Greek imagination. It is the nature of Thucydides, implacable and aloof. Is there room for the law of the measure in the world such as this? It was the genius of Democritus to define an ethics that meets the conditions so fixed by Leucippean physics. Nature is "necessity", not "justice"; neither good nor evil in itself; not intelligent, though intelligible. Yet its intelligibility alone, divested of any moral quality whatsoever, yields sufficient ground for the law of the measure. The good is not given to man; it is not "chance." It must be created by man; it is "art". Yet art is itself the child of necessity. As Plato would note with extreme displeasure, it is a late-comer in nature.[34] But it advances nonetheless man's self-sufficiency in nature, and this not only by mechanical invention, but also by the power of the "teaching that makes nature" to transform chance pleasure into cheerful well-being.

Anything more or less than this would be *hybris:* desire for the impossible, or contempt for the possible. *Nemesis* follows on any act thus disregarding the humanly possible within the limit of the naturally necessary. This is the measure; and its knowledge empowers the soul to build upon nature goodness and justice which would otherwise not be found in nature at all. Because it masters the world so far as it can be mastered, and cures the ills of the soul so far as they can be cured, this "wisdom undismayed is worth everything" (B. 216).

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[33] I shall offer shortly a fresh interpretation of this development from Anaximander to Empedocles. There is an excellent discussion of Parmenides and Anaximander in H. Fraenkel, "Parmenidesstudien," *Goettingische Nachrichten*, Philol.-Hist. Klasse, 1930, p. 153 f. See also Jaeger, *Paideia*, I, ch. ix; and R. Mondolfo, *Problemi del Pensiero Antico* (Bologna, 1936), ch. ii.

[34] As in Laws x, 889c, where the atheistic materialists teach that "as a later product of these (sc. nature and chance), art comes later". Since Plato and Aristotle wilfully use "chance" to denote the "necessity" of the *physiologoi*, this applies exactly, though not exclusively, to the Democritean doctrine.

DISCUSSION

JORDAN'S THEORY OF THE CORPORATE WILL[1]

I. EXPOSITION

JORDAN'S Copernican revolution consists in turning away from "the abstract isolated individual as ultimate postulate" and "approaching all problems from the viewpoint of corporate mind as the ultimate postulate". Whitehead in metaphysics, and Driesch, Ritter, Morgan, and others in biology, have converged on the concept of corporate wholes; but Jordan, in *Types of Individuality* and *Theory of Legislation,* has made the first thorough and comprehensive restatement of all the social concepts in terms of the corporate individual. In so doing he has given us a singularly original, profound, and powerful social and political philosophy.

Idealists of the Hegelian tradition may protest that they themselves have already developed Jordan's postulate in their metaphysical theory of the State; that they have always subordinated personal will to corporate will, and individual spirit to corporate spirit. Their contention is true; Jordan owes much to the idealists. But the difference between Jordan's approach and that of the idealists is that Jordan investigates and describes the will objectively in terms of the facts of order; he therefore discards the idealistic concepts of group mind, indwelling spirit, and universal will as grounds of unity and as entities underlying and different from the facts of order and direction.

In fact Jordan discards *all* the traditional characterizations of will. Will is not a special kind of energy, though it is, like all cases of organized fact, a manifestation of cosmic energy. Will is not spontaneity,

[1] An earlier version of this discussion was read before the Western Division of the American Philosophical Association on April 27, 1940.

though in certain forms it manifests spontaneity. Will is not identical with physiological structure, though physical coordination is part of the ordered whole constituting personal will, just as the physical plant is part of the order constituting the corporate will of an industrial organization. Above all, will is not non-existent, as Hume concluded, though will as an entity apart from the organization of fact *is* non-existent. Will, whether corporate or personal, must be described positively as an objective phenomenon and interpreted in terms of the processes of growth-change.

Jordan describes will in various ways depending on the relationship he wishes to emphasize, but the most characteristic definition is as follows: *Will is the fact of order, when order is considered in its aspect of involving consequence.*[2] Or "Any human effort which results, or tends to result, in ends, will be regarded as an aspect of will".[3]

It is necessary to analyse this definition with respect to the two key terms, *order* and *consequence* or *ends*. Order, of course, implies wholeness and unity; no mere aggregate or group is an order; and order cannot be derived from aggregates of elements. Order consists in relatedness and structure; it is therefore indifferent to the particular constituent facts or contents; a given order of relations or structure can maintain itself with continuous substitutions of its component elements. The life process continually elaborates forms of order—organisms, plant societies, animal heards, cities of men, religious orders, business corporations, states. A *minded order* is one having direction; that is, it has conscious purpose. A *principled order* is one having law; that is, it is controlled by legislative, administrative, and judicial processes. It follows from Jordan's definition of will as order, and from the fact that older is indifferent to its particular content, that a corporate will is independent of particular individual desires or competing interests. It also follows that individual will does not consist in the integration of separate impulses or life demands. The nature of the will must be sought in the nature of the whole, its organization, internal relationships, and external references.

Ends or consequences may or may not be conscious. At its lowest level consequence is simply sequence. Biological organisms manifest self-repair, defensive reactions, reproduction, and other acts of self-maintenance. The consequence is endless repetition, mere sequence. Even at this level, however, the end is a universal, namely, the species. But the unity or individuality attained is limited by the shortness of the life span, by the limits imposed by natural tensions on size and shape, and by endless repetition instead of cumulative attainment of external ends. *Human individuals* can formulate ends and they can prefer one end to another

[2] Jordan, *Theory of Legislation*. Indianapolis, 1930. P. 81. Italics mine.
[3] *Ibid.*, 46.

through preponderance of feeling. Complete and adequate embodiment of the will, for the individual person, would consist in cumulative growth leading to the attainment of his ideal—"an embodiment which was satisfactory from the point of view of original feeling".[4]

The trouble is, however, that as a natural organism man cannot attain ends. He can always see more than he can perform; his reach exceeds his grasp. *Corporate individuals* have the power needed to attain ends; but, not having intelligence, they cannot foresee ends or frame ideals. On the other hand, since they have unlimited life span and unlimited capacity for growth, they do not, like biological organisms, repeat themselves endlessly by reproduction. They *can* devise instruments, but since they have no more ultimate ends in view, the devising of instruments—tools, machines, machines to make machines—becomes to corporations a sort of pseudo-end. Self-maintenance, growth in bulk, and endless elaboration of tools, are, then, the normal ends of corporate individuals. At least such is the tendency of unminded and unprincipled corporate will.

Ends, according to Jordan, are universal. I am not clear as to why he insists on the universality of ends, but the explanation seems to be about as follows: Since it is always a consummation of growth-process, the end is always an order in which the individual will can embody itself. This ideal order, like *all order,* is indifferent to any particular content. The practical problem is to find experimentally *some* concrete particular body of detail which will satisfy the ideal. The end, then, is universal and indifferent to the particular content of its realization. International peace, for example, might be objectified in any of several material and social situations; the problem is to find *one* such concrete embodiment. The object is international peace; the objective is one particular case of ordered fact embodying international peace.

The implications of the universality of ends are important. Private wants, wishes, demands, are usually for particular things. We want to do this, to have that, to be a certain person, to create a certain impression. These particular private wishes, at least in their first raw form, have nothing to do with individual will. Real individual will consists in the growth processes directed towards an ideal—a life ordered by a universal end. Still less have private wants and demands anything to do with the *public* will. There is no possibility of ordering subjective wants. It is their nature to be particular, irrational, urgent, and irreconcilable. The *end* envisaged by the legislator is an ideal public order into which the present public order may grow when the law of its growth is clarified and rationalized.

[4] *Ibid.*, 208.

The foregoing considerations develop some of the meaning packed into Jordan's definition of will: "Will is the fact of order, when order is viewed in its aspect of involving consequence." Since both personal and corporate individuals exhibit order directed towards ends, the difference between personal and corporate will is not one kind but of degree. The essential difference is in the degree of universality of ends. "The social or general will bears the same relation to the individual will that the universal bears to the particular."[5] This is Jordan's statement, but since he elsewhere states that it is the nature of all ends to be universal, I must interpret his statement as meaning: "The social or general will bears the same relation to the individual will that the more universal bears to the less." Greater universality would mean greater indifference to specific fulfillment in detail. National ideals, for example, are much more schematic than personal ideals and permit of far greater variety of concrete organization.

The center of Jordan's theory of corporate will lies in the contrast he draws between corporate life and mind and those of two other types. There are, he says, three fundamentally different types of life with corresponding types of will: (1) The pure immediacy of organic life in biological organisms, (2) the pure mediacy of speculative life in man as individual, (3) the intermediary life of feeling in corporate individuals.

> The will of the corporate order is therefore neither the pure immediacy of the organic life of man which expresses itself as mere urgency, nor the pure mediacy of his speculative life which expresses itself as agency. Its status is thus intermediate, and if we are to make this clear by interpreting it in terms of experience, we shall have to connect the effective will of corporate order with feeling as its objective or personal counterpart.[6]

The first of these types of will, the pure immediacy of organic life, is immaterial to our discussion. Life urge is, of course, at the bottom of all action, but we are here concerned with the mediate and intermediate forms.

The second type of will, the pure mediacy of speculative life in men and individuals is, I gather, a limit. Man has biological urgency as well as intelligence, and man is practical as well as speculative. But the practical man is characteristically the man who does not *know*, and the man who reflects and speculates is characteristically the man who does not *act*. Life as intellect has two functions, reflection and speculation. Reflection is the process of analyzing, arranging, and ordering; it is at

[5] *Forms of Individuality.* Indianapolis, 1927. P. 267.
[6] *Theory of Legislation,* 250.

home in history and pure science; it is clear, cold, comprehensive; it is unrelated to action. Speculation is the process of projection. Its function is to reveal future possibilities, to *see*. It therefore formulates ideals as possible futures; it determines ends. But neither as reflection nor as speculation has intellect any effectiveness in realizing ideals. All the agencies by which individual man can achieve ends are corporate, and corporate life controls the individual far more than any individual can control the corporation. The practical man has no ends, but only wants or interests; the speculative man has genuine ends, but he is hopelessly incapable of attaining them.

The corporate life, on the other hand, could attain ends; but as corporation it has no intellect, and so it has no vision, no ideals, and therefore no ends outside itself. The corporate will is only one grade removed from biological immediacy.

> It is in the realm of action of the corporate individual that acts are executed really, and where *things are made* constructed in immediacy . . . The corporate will therefore produces but it does not create. It *re*produces indefinitely, its law is infinite process, and as scientific abstraction, the biological organism is its perfect instance. It acts in and through its own structure immediately, and its products are continuous with the mass and matter of its own body.[1]

What differentiates the corporate life from the pure immediacy of biological life is the emergence of feeling. Feeling is not merely subjective nor yet a mysterious force, but an objective phenomenon "after its own kind". In individual man, feeling is the ground of experience, and experience is the ground of judgment. In a society, only individuals have feelings, but since feeling is readily communicated and shared, feeling "subsists" in the social order in a way in which speculative or reflective thought does not. Feeling, therefore, in the corporate body, exerts an "influence". When circumstances change for a society, the order can generate within itself out of its own feeling-mass the will to repair the damage or change its mode of life to suit the changed circumstances. It is thus that mass migrations take place, or the change from herding to agricultural life. The adjustments are made in response to feelings of unrest, irritation, fear, or want. They are not the result of deliberate, conscious planning. The highest elaboration of feeling of which the corporate order is capable is consciousness of want or of interest.

The corporation, therefore, as corporation and apart from a few of its members, is incapable of universal ends outside of itself. Its consciousness is "exhausted in the comprehension of the system of its own internal functions". It has no reference outside of itself. It is non-

[1] *Ibid.*, 241.

moral in that it cannot adopt "the role of the Other". In fact, it has no Other. The environment of a corporate individual is other corporate individuals, but in its contact with other corporations its typical action is either to destroy or absorb them.

Jordan's problem is to show how a corporate individual, naturally blind but composed of human individuals with power of reflection and speculation, can be ordered and regulated with reference to ideal ends. This is the problem of legislation, a problem lying outside the scope of this paper.[8] The state, as the all-inclusive super-order, legislates *for* its constituent corporate orders for two reasons: (1) so that every corporate body will perform its function and every function shall be performed, and (2) so that the life of personal individuals, necessarily embodied in corporate life, will be made significant.

II. CRITICISM

Of Jordan's general approach I have no criticism. My criticism is based on the question of fact and the interpretation of facts. For the sake of brevity and clarity I shall discuss only two of the propositions mentioned in the foregoing exposition.

1. The first of these propositions is the *thesis* of Jordan's Hegelian syllogism.

> Life as effective will in the human being, either individually or collectively, is essentially speculative by nature, and its function is to see—to foresee—to envisage and idealize ends. But it is powerless to attain any of these ends in objective form.[9]

To deny that intelligence is essentially speculative would be to repeat the whole pragmatic argument regarding the nature and function of ideas from Peirce to Dewey. To see with the eyes is to be capable of acting with reference to distant objects; to have insight and foresight is to be capable of acting with reference to the inside of objects and to objects distant in time. Jordan is right in saying that the function of speculation is to see into and to see ahead, but this statement stops short of the real life-serving function, that of *acting* with reference to the hidden and the future. Speculation and practical action therefore belong together. This being the case, man is not *by nature* powerless to attain ends.

If man is as a matter of fact powerless to attain ends, this futility must be due to the nature of the corporate life through which he must act. Every thoughtful person feels, at times, the hopelessness of his individ-

[8] See my article "Social Ideals and the Law", this *Review* XLVI, 2 (March 1937), 113-131.

[9] Theory of Legislation, 248.

ual efforts to mould the corporate orders of which he is a part—the educational system, the financial institutions, the business corporations, the newspapers and radio. And yet I cannot feel that individual life, even in the world as now constituted, is futile. *In the first place,* democracy stands for freedom of people to associate and organize for practically any purpose. Democracy in this sense still exists in specially favored regions; witness the multiplicity of organizations spring into being spontaneously around every conceivable purpose. In these small, face-to-face groups, an individual finds the agency for his most cherished ends and his most satisfying achievements. *In the second place,* though he cannot control the gigantic corporate systems in which he lives, he can *use* them for his own ends. His only concern with them is that they perform their function properly. The fact that the individual has little control over the bank, the railroad, or the gas company, and that their ends are not his ends, leaves him free to use them for his own purposes without any call for his cooperation or loyalty.

I conclude that the individual having ends to attain has considerable latitude for attaining them. His reflective and speculative intelligence is at home in practical action, he can unite with others to form small corporate orders in which his participation can be effective, and he can use the effective agency of large corporations.

2. The second proposition is the antithesis in the syllogism. It reads:

> Life as effective will in the corporate individuality of institutions attain its ends in immediate form, but it does this blindly, and the ends attained are raw concreteness without meaning.[10]

This proposition is supported by Jordan both by objective description and by reason. As description I must admit that it has a certain aptness as applied to many of our business corporations and to industry in general. As metaphysics the proposition is a corollary of the proposition that corporate life is a life of feeling and that interest is its highest form of consciousness.

Only individual persons can reflect and speculate, according to Jordan, and therefore corporations cannot envisage ends. But is it not true that only individuals *feel?* Jordan admits this is a fashion. "And while feeling exists only subjectively in the individual, yet it subsists as an essential constitutent of the larger corporate whole in which the individual is primarily a function". Mass feelings, he explains, "take on permanent status in the order of fact". Feelings of anger, uneasiness, foreboding, or want are grounded in the material and social relationships; they arise or subside with changing conditions, they precede and cause mass move-

[10] *Ibid.*, 248, 249.

ments and changes in the mores. Popular feeling becomes embodied in art, rituals, and institutions. Thus corporate feeling "substantiates itself". But, Jordan says, the highest development of such feeling is consciousness of want or interest, and this is the level of mind of business corporations, religions, clubs, fraternities, and all corporate individuals.

But what holds of feeling also holds of opinion and to some extent of ideals. Jordan denies that there is any such thing as public opinion, but I cannot agree that "public opinion" is a meaningless term. It denotes those opinions shared by members of the public as a result of communication and discussion. These opinions are the product of conditions and relationships of the community, and are among the facts to be noted in that order. Like mass feelings, they are communicated and shared, and like mass feelings they "substantiate themselves" in art, customs, and institutions. Opinion among bankers differs from opinion in scientific circles, and is embodied in different techniques and publications and social arrangements. While only individuals think, public opinion and corporate decisions are features of societies when viewed as corporate wholes.

According to Jordan, the synthesis of the opposites—individual persons with ability to speculate on ends but without power to realize them, and corporations with power to achieve but without ability to envisage ends—is, or could be, the State. It is the function of legislators to determine social ends, to formulate policy, and to set up autonomous corporations, either publicly owned or private, to achieve them. It is the function of the judiciary to watch over these corporations, to judge their effectiveness in carrying out the purpose for which they were instituted, and to recommend corrections for failure or inadequacy. We therefore have at hand the means both in government authorities or bureaus and private corporations for effectively realizing the ends determined by democratic legislation.

While applauding much of Jordan's masterly treatment of the role of legislation and jurisprudence, it is not my purpose to discuss this part of his social philosophy. My present interest is in the corporations which constitute such a dominant feature of our social and industrial life. If the State through its legislative and judicial processes can envisage ends and realize them, is there any reason why lesser corporations cannot do so too? Is not the State a corporation?

The difference between the State and other organizations is that the State covers all public interests while various societies, clubs, religions, and business corporations answer to special interests. Or we could say that the State is concerned with the public good while other corporations are concerned with various particular goods. Not all organizations are public in nature. People assemble freely and group themselves into

associations whenever a common purpose unites them. It is only when their activities have consequences of sufficient importance for other people that they become "affected with public interest". When they do come under official scrutiny, they are required to register and are licensed to perform their public service whatever it may be. The State can then hold them responsible not only for fulfilling their principal function, but also for their indirect consequences. Coal mining companies, for example, must not only furnish the nation's fuel, but they must provide working conditions and standards of living in conformity with prevailing public policy.

It is not necessary that the State dictate the ends of corporations; the spirit of democracy consists in leaving as much freedom as as possible to persons and corporations. If corporations will assume responsibility for the consequences of their activities, interference may not be required. If they will not assume responsibility, then the State must find means to hold them responsible.

The assumption of responsibility implies that the corporation take measures to keep itself informed on the consequences of its acts; that it devise means of intelligently formulating and weighing the ends which it shall achieve; and that it bring these ends or consequences into conformity with the general good. A corporation, like the State, has resources in technical research, in high-grade minds, and in human feeling. Responsibility requires that they devise special organs for making use of these resources. The blindness and stupidity of corporations are not incurable. Some of them never were either blind or stupid; many of them are beginning to open their eyes and use their minds; others can be induced or compelled to do so.

Corporations make decisions; the differences among them depend on how they make up their minds. Will is manifested in cases requiring choice, and corporate wills differ in the ways in which they make choices. Four typical methods may be distinguished, and I can make my point best by characterizing them.

The *first* and most primitive is the autocratic type. One man or a small clique makes the decisions, and naturally they choose according to their own interests. This is the type represented by most business corporations; a controlling block of stock or a sheaf of proxies gives the holder power to make the decisions. Neither investors nor workers are likely to find that type of corporation adapted to the requirements of life. Even benevolent autocracy cannot redeem such an organization from caprice on the part of management and a feeling of personal futility on the part of members.

The *second* is the popular leader type. The leader, holding his leader-

ship by the loyalty and confidence of his followers, makes the decisions. He may be guided by a prudent regard for popular feeling, and he may make vicarious use of the experience and judgment of his more trusted subordinates or technical experts, but he himself makes the fateful choices. This is the highly vaunted fascist method. City and state governments in this country have frequently conformed to the popular leader type of organization. So too have our criminal gangs. The leaders have been colorful, dramatic personalities depending on ward bosses equally colorful and dramatic in the eyes of their followers. The basis of these corporate orders is mass feeling. The followers find satisfaction in having their immediate needs provided for and in participating in pageants or demonstrations; but they do not find their more mature wills objectified.

The *third* is the pressure group type commonly but erroneously identified with democratic government. Bargain and compromise are its techniques. Graft and bribery are its typical evils. This method of arriving at majority decisions seldom transcends the level of private interest or achieves stable policy directed towards ends. An individual capable of insight and foresight will not find in this type of corporate order a suitable embodiment of his will. Needless to say the pressure-group method of arriving at decisions characterizes many corporations besides the various city, state, and national governments. We see it in operation in church councils, faculty meetings, farmers' conventions, and labor organizations. But however much we may deplore the evils of this form of corporate will, it does exhibit the meeting of minds in bargaining instead of blind feeling and supine acceptance of an autocratic will.

The *fourth* is the deliberative type. Decisions are the result of discussions in which all members or their elected representatives participate. The process by which personal opinions and group prejudices become transmuted into public policy is too well known to require exposition. In my view, Jordan has overemphasized the role of speculation and underestimated the crude beginnings of corporate will in private wants. Rational deliberation is the means by which the intelligent desires of individuals and groups are communicated, shared, modified, and generalized, till a common purpose emerges, backed and supported by all members. The practice of corporate business of overpowering opposition by the weight of fifty-one percent of voting stock—in fact the practice of voting by number of shares rather than by persons—is a hideous caricature of rational deliberation. Similarly, majority rule is at best a method of terminating deliberation, and not the essential feature of democratic procedure. Rational deliberation is, in short, the method by which a community discovers what Rousseau called "the general will";

that is, it is the method by which a community discovers its "real" wants or the common good, as opposed to short-sighted, one-sided, and selfish "practical" wants.

In summing up I may add a few more comments. Jordan's Hegelian syllogism provides a powerful analysis of the workings of corporate will in our society. It contains so much of truth that my criticisms may appear as carping over non-essentials. Nevertheless, I maintain that concepts should cover the facts, and a dialectic should be faithful to actual movements. It is not strictly true that individual persons, by scientific analysis and speculation, can envisage the good, but cannot achieve ends. While in many respects the individual agent cannot pit his strength against that of machine politics and corporate business, yet he can become effective by actively organizing or joining groups of people for common objectives. Moreover, one of the main sources of social injustice is that a large number of forceful, practical men, *do* achieve personal power by directing and manipulating vast industrial and financial empires, not to mention religious and political kingdoms. Again it is not strictly true that corporate individuals, (that is, corporately organized groups) have power to act, but cannot envisage ends. It is all too true that institutions are afflicted with an inherent tendency to blindness; that self-perpetuation, expansion, tool-making, or profit-making are pseudo-ends for which corporations have a fatal attraction. But corporations have resources of technical equipment, scientifically trained men, members with ordinary human emotions and social attitudes. And corporations can be induced or compelled to make use of these resources. They can foresee the consequences of their acts readily enough if we can find means to hold them responsible for those consequences. The corporation as a whole should be held responsible, not a particular villain or scapegoat. As the late President Roosevelt said: "A business has no right to exist if it cannot pay its employees a living wage." Generalizing this statement we have the principle that corporations are responsible not only for the fixed ends for which they were organized, but for all the indirect consequences of their acts. Any corporation is quite able to assume these responsibilities without government coercion; many of them do. They do not have to have the State determine their ends for them; they can do this important task for themselves. But the only way they can deliberate on policy and evaluate ends effectively is through democratic processes.

The Great Community envisaged by Dewey would be one in which a very large proportion of organized societies and institutions are spontaneous in origin, centered about purposes of their own choosing, and governed by their own democratic processes of deliberation and evalua-

tion. We would then have a society characterized by initiative, growth at many points, and liberation of energy for abundant, varied life. At the same time, when corporations have indirect consequences necessitating public attention they would be held responsible in the degree called for. In such a community no precise line could be drawn between private persons or associations, organizations and business corporations under state license and control, and governmental bureaus and agencies. Spheres that are private today may be affected with public interest tomorrow, and vice versa.

The world today needs a theory of corporate individuals and corporate will. In answering this need Professor Jordan's well elaborated theory is timely and important. My criticisms are mainly two. The first is that if the speculative reason can envisage ends but cannot realize them, then private life and associations are futile. But the experience of man is that private life is precious and worth preserving. The second is that if corporations can act but cannot envisage ideals or evaluate ends, then the State must determine their ends and judge their efficiency. If this were the case, there could be little fredom, responsibility, or initiative in corporate life. Recent experience, on the contrary, indicates that many corporations are quite willing and able to assume responsibility, and others can be induced or compelled to do so. Jordan's approach to the problem through the objective facts of ordered wholes appears to me wholly commendable.

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REFLECTIONS ON "CAUSATION AND PERCEPTION"*

THE problems raised by Professor Sellars' excellent article on the cognitive role of perception deserve extensive study and discussion. Personally, I find myself largely in agreement with its contentions, and most of my criticism, as offered below, is constructive in character.

One of the chief points of the article is a distinction, clear in itself, between sensation and perception. According to the author, "sensations take their place as sense-data and sensory appearances and symbols within perception". As can be readily seen from the context of this passage, the relationship is one of succession; that is to say, sensation precedes perception. If I understand it correctly, the term 'sensation' applies here primarily to the physiological processes, mainly neural, which, at their completion, may result in sense-data; these sense-data are the raw material of perception. Perception, on the other hand, as opposed to sensation, is a question not so much of bodily states as of mental states. Unless this is so, I can see no meaning in the author's reference to sense-data as "inspectable".

This conclusion need not mean that perception is not fundamentally physiological. Undoubtedly, it is; it is a manifestation of some material activity. More specifically, it is rooted in functions of the brain and nervous system, and cannot arise apart from them. What differentiates mental states from other physiological states, however, is that the former constitute what is experienced as consciousness and can be known directly by the subject, together with their reference to some object or event, whereas the latter, as bodily states, do not participate in cognitive processes and have little if anything to do with consciousness. Perception is most interesting to us not as a type of material processes which reveal hardly anything of significance to us, but as a type of mental activities which open practically the entire external world to our cognition.

* See this *Review*, LIII, 6.

The distinction between sensation and perception is further qualified by the author with regard to the direction of their activities. Perception is defined as "a complex, dominantly sensuous, interpretative activity in the reverse direction to that of sensing". Unfortunately, Professor Sellars does not make sufficiently clear exactly what he means by 'reverse'; and the term 'interpretative', so obvious when applied to total mental activity, does not seem to be quite convincing with regard to perception alone. Let us discuss these two points separately.

I presume that "the reverse direction" of perception, as used in the article, does not refer to any processes in the nervous system. Rather, both directions, that of sensation and that of perception, indicate the relationship between a perceived object and the perceiving subject. In sensation, activity flows from the object to the subject, whereas, in perception, mental activity refers or points to the object. Somewhat disturbing here is the repeated use of the word 'responsive', as if the author did not see any important difference between 'perception' and 'response'.

It would be interesting to know the author's views on the physiological origin of perception. As long as we abstain from facing this problem squarely and speak of mental states without trying at least to account for them in terms of bodily processes, it makes really little difference whether we ascribe their origin to the soul, spirit, mind, or nothing at all. The use of words has its responsibilities. Having conceded by implication that mental states are a form of bodily states, we should strive to explain the connection.

It seems to me that the only hypothesis that reconciles scientific facts with Professor Sellars' doctrine is this: that perception is a sort of projection arising in nerve centers. This activity of projection, as I see it, constitutes a device of nature enabling the human mind (or the brain, on the objective side), under normal conditions, to refer its contents right back to the source of stimulation, in the reverse direction to that of sensation. The device is by no means superfluous, as it endows human beings, along with certain higher animals, with a superior ability to deal with objects at a distance from stimulating agents, and also in accordance with their past experience and in advance of, and in preparation for, stimulation.

The fact of perceptual projection is perhaps beyond all physiological verification. Nevertheless, it is not to be rejected for this reason, as the fact is quite obvious, in so far as it is implied in any experience dealing with the external world. It cannot be denied, indeed, that perception is primarily mental in character and that it takes the form of visual, auditory, olfactory, and other images; as such, it can never go beyond sense-

data and deal directly with things and events themselves. As Kant so clearly saw, mind is necessarily confined to its own contents. And yet perception, in its broader meaning, refers undeniably to something outside the brain, namely, to something within the body (as in pain), on its surface (as in touch), or in space (as in vision).

This very real fact, and moreover one essential for the understanding of the problem of perception, is nevertheless referred to by Professor Sellars, somewhat disparagingly, as the mystery of transcendence. He states that perception involves no transcendence at all, "but merely a denotative reference to public existents of which the percipient is one". But the reference of images of perception to something outside the body, if not outside the mind, is already a kind of transcendence. If Professor Sellars has in view only the question of mind, within which perception arises and necessarily remains, it may be possible to agree with his position. However, even then the other side of the story, namely, how sensory knowledge points beyond the bodily boundaries, will have to be somehow accounted for.

As far as the qualification of perception as 'interpretative' is concerned, it should be preferably replaced, in my opinion, by 'modifying', in so far as it is questionable that interpretation is an aspect of perception itself, rather than of other mental activities arising in emotion, reasoning, imagining, and recalling. No doubt, perception is affected by interpretation, but it is formed actually only by the subtraction and addition of elements. Through subtraction, perception becomes selective, in so far as it excludes numerous sensations and makes prominent some of those remaining, as has been demonstrated by contemporary psychologists, particularly configurationists. Through addition, perceived images are colored with emotions and endowed with elements of logic and imagination and memory. The important point here is that these elements are not created by perception, but rather added or subtracted. The author himself seems to be aware of this, however, for he declares that "perception involves the supplementation of sensations by concepts and meanings in the service of the directed response".

It seems to me that the author fails to make clear another important characteristic of perception. In calling it "an elementary element of cognition", he does not describe it as simple, of course—elsewhere he explicitly calls it complex—but rather as primary or immediate. I am not sure which of the two designations Professor Sellars would prefer. Personally, I think that the primacy of perception is not its main characteristic, even as a cognitive activity. It is generally acknowledged that perception is the ultimate source of all cognitive activities, including even reasoning. The basic distinction between perception and reasoning,

then, is that, whereas the latter obtains knowledge mediately, the former does it *immediately*. Knowledge concerning the external world is just given in sense-data, in accordance with different hereditary functions of separate sense organs. To my mind, this should have been pointed out.

The critical remarks, as given above, are not really directed against Professor Sellars' theory of cognition. On the whole, I accept it. Moreover, I realize only too well that it is impossible to present a full discussion of such a big problem as that of cognition through perception within the limits of a single article. Rather, my remarks have been designed to bring out certain essential points which are not sufficiently clarified by the author of "Causation and Perception", though probably quite familiar to him, but which are, in my opinion, highly important to give strength and completeness to the very argument he develops.

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PHILOSOPHICAL ASPECT OF STATISTICAL THEORY

IT IS one of the unfortunate aspects of our present world of philosophy and science that great revolutionary changes occurring in one field are apt to be neglected by the other. This situation is an aspect of cultural lag that is doubly unfortunate, for both fields suffer thereby; the one in which the changes are taking place because of a lack of the broader outlook to be supplied by the other, and the other because it proceeds on its older, and now less adequate ways, without regard for the new progressive step.

Now a lag on the part of philosophy might seem to be no serious concern of the scientist, were it not that the scientist has most often shown himself to be incapable of a philosophical criticism of his new attitude; lacking in self-consciousness concerning his progress, he fails to provide the necessary critique that will integrate his revolution with all other aspects of truth-finding.

For the past fifteen years there has occurred in a field now commonly known as "mathematical statistics" a revolution whose philosophical aspects it would be difficult to overemphasize. So far as I know, the only pertinent philosophical thinking on this subject is to be found in the writings of the statisticians themselves, and they show the usual lack of a generalized vision of the implications of their work. Because the history of the statistical revolution is well buried in specialized journals, it will be well to review its important features.

In 1763 appeared Thomas Bayes' famous (or perhaps infamous) article which purported to enable the experimenter to estimate the probability of a certain event on the basis of observations; that is, it appeared to provide a method of calculating *a posteriori* probabilities. The importance of this step in a field of research which had hitherto emphasized only the *a priori* or formal aspects of probability theory, is easily seen. Previously, the mathematicians had been content to study the formal aspects of probabilities and to deduce from certain formal definitions and postu-

lates rather complicated theorems; but the application of all this theoretical work to experimental problems was difficult to determine. To employ a simple example, one could demonstrate on the basis of certain hypotheses and definitions, that the chance of observing all heads in six horizontal spins of an unbiased coin is exactly one in sixty-four. But the question of interest to the experimenter would be to determine the probability of six consecutive heads of *this* given coin; and, unless he postulates his answer, it is not apparent how he can ever make use of the results of probability theory. If the coin is unbiased, then the required answer will be one in sixty-four, but if the coin is, say, a 1923 silver dollar, which, incidentally seems to be heavily biased, the answer may actually be one in a million. Granted that one can construct a complete abstract theory of probability, the problem still remains concerning the applicability of this theory. Or, more precisely, the problem remains to show the relationship between a formal theory of probability and the non-formal aspects of experimental method.

Though Bayes' theorem appeared to provide a method for making probability inferences independent of prior knowledge, a more critical examination of its meaning showed that it actually did no such thing. For upon closer examination, it was apparent that the theorem, to be applied, required that we know certain "distribution laws" *a priori*. In subsequent writings on the theory of probability, various attempts were made to describe the manner in which these distribution functions could be estimated; the solution most frequently used, and criticized, was that in view of one's ignorance to the contrary, the required functions should be constant. This solution went under the familiar name of "principle of insufficient reason", and is the object of numerous paradoxes.

Out of the difficulties encountered in the experimental application of Bayes' theorem arose, at least implicitly, the fundamental problem of statistical inference: how to know that one has made the strongest inferences from observations without presupposing (implicitly) the true probabilities? It should be noted that the fundamental problem demands, in effect, criteria by which the experimenter is to judge whether he has made the strongest, i.e., the most fruitful inferences from his data. The term "strongest" is used in both its logical and its probability sense. p is the strongest inference (or set of inferences) if any other inference from the observations is either implied by p, or is less probable[1] than p. It should also be noted that the fundamental problem of statistical inference turns out to be the fundamental problem of experimental inference, or of non-formal inference, if one accepts the philosophical view

[1] Statisticians would prefer to say "less likely", reserving the term "probable" for another sense.

that all exact inference is from quantitative measurements. The need for an adequate answer to this problem appears obvious, for if the true probabilities are assumed, then so apparently are all the inferences, independent of the observations, so that the need of experiment appears unnecessary. Put into Kantian terms, the fundamental problem is to determine how a non-formal probability inference is possible.

Though this fundamental problem did not receive adequate treatment in the eighteenth and nineteenth century, nevertheless the work of Laplace, Gauss, Helmert, and many others provided the theoretical foundations necessary for the present solution. It is true that methods were offered in this period for making inferences from observations, but apparently the determination of the criteria for the most powerful use of data was not considered except in special instances: thus the "least squares solution" stated that the most probable value of an unknown was that which minimized the sum of the squares of the residuals, but this criterion is well known not to have general applicability: there are examples where such minimization is far from sufficient to establish the best estimate of an unknown measure.

It was chiefly through the work of Karl Pearson and "Student" that a preliminary solution to the problem was made. The recent advances are really mathematical perfections of these beginnings.

The most favorably accepted solution to the fundamental problem, if one judges from recent issues of American and British statistical journals, is that of E. S. Pearson and J. Neyman. As a matter of fact, theirs appears to be the only fully developed solution, though R. A. Fisher has offered a formally incomplete answer. Pearson and Neyman provide in a wide range of cases the strongest inference in the probability sense. A simple example will aid in understanding Pearson and Neyman's purpose and the direction which their solution takes. Suppose that an agriculturalist has two kinds of corn seed and is anxious to find out which one produces the greater amount of corn. To this end, he plants the two kinds of seed in various fields, differing in fertility, exposure to sun, slope of ground, etc. At the end of the period he collects all his data together into two groups, the one containing information on the yield of seed A, the other information on seed B. If he is very lucky, the yield of A will be larger in every case than that of B, and his problem of inferring from the data which is the better seed will be quite easily solved. But very frequently the information will not be of this simple sort, and in some cases A will have a greater yield, in others a less or equal. What is the "best guess" the agriculturalist can make?

This is the sort of question Pearson and Newman ask, and their chief concern is to define the adjective "best" and to set up procedures by

which the best test can be conducted. This is a problem of value, and is really philosophical in character. However, Pearson and Neyman think that the definition of the "best guess" is intuitively obvious once one has hit upon it. Considering now the example above, one may describe the problem as follows: there are three hypotheses possible: 1) that A and B do not differ in quality; 2) that they do differ, and that A has greater yield than B; and 3) that B has greater yield than A. It is usual to call the first hypothesis the "null-hypothesis", and the others the "alternative hypotheses". The agriculturalist's problem in these terms is simply that of choosing the null-hypothesis or one of the alternatives. Now, say Pearson and Neyman, if the experimenter should happen to make a wrong guess, he can make two kinds of error. An error of the first kind would occur if he rejected the null hypothesis when it was really true. That is, if the experimenter guesses that A is a better seed than B (or vice versa) when actually there is no real difference, he commits an error of the first kind. An error of the second kind would occur if he accepted the null-hypothesis when it was really false; i.e., he asserts that there is no difference in quality between A and B, when actually, say, A is the better seed. The Pearson-Neyman theory states simply that the "best" statistical test our agriculturalist can run is one that has the following characteristic: let p be any given probability of an error of the first kind; i.e., p is the chance that one will reject the null-hypothesis when it is true. Pearson and Neyman define the best test as the test which minimizes the risk of committing an error of the second type, no matter what the alternative hypothesis may be. (It need not detain us here that a best test does not always exist in this sense, because in these cases Pearson and Neyman give similar criteria that have the same import.)

Suppose, for example, that the agriculturalist should be so naive as to state that A and B were of the same quality if and only if their yields were exactly the same. That is, he will reject the null-hypothesis unless the yields are identical. Then he runs quite a large risk of rejecting the null-hypothesis when it is true, i.e., of committing an error of the first kind, though the risk of an error of the second kind may be quite small: there would be many conceivable cases where the seeds had the same quality, but differed in their yields because of uncontrolled variations in soil, wind, etc. A "better" test would be one that made both types of error as small as possible, and this test represents the strongest probability inference.

Pearson and Neyman do not consider the problem of the strongest solution in the logical sense; that is, their examples usually presuppose that the form of the null-hypothesis and its alternatives is given, and their theory is designed to provide the most powerful selection among

these alternatives. But the pertinent problem always remains: what hypothesis should one test to obtain the maximum information in the logical sense from the observations? It is not hard to see that the choice of hypotheses is dependent upon the purpose one had in mind in conducting the experiment in the first place, and consequently a preliminary view is that no general answer to the question seems possible. But if we grant that there is one (unattainable) purpose common to all science, namely, the reduction of error to zero, then one can reasonably ask which choice of hypotheses is best designed to forward this purpose. For example, one's purpose might be to determine the distance between the centers of gravity of two points, where the conditions of the problem are such as to make the answer single-valued. We suppose the experimenter to have just completed his 100th observation, then the general inquiry would be whether the error of observation has decreased in accordance with the null-hypothesis or some other hypothesis. If the experimenter is led to reject the null-hypothesis at the end of the nth observation, then he must check all the presuppositions involved in the making of his observations; if he accepts the null-hypothesis then he may proceed in making his determinations. The logical problem would be to formulate precisely the definition of "reduction of error", and the statistical problem would be to provide the most powerful test. The logical problem is at least in part philosophical, for it demands an explanation of what a "true" value means, what an error means, and the kind of nature that must be assumed if these concepts are to have any meaning at all.

The problem of the logical power of statistical tests is only one philosophical problem that is suggested, but left unanswered by the Pearson-Neyman theory. It will suffice to suggest another one which is in a sense basic to the meaning of the Pearson-Neyman criterion. This problem is concerned with the meaning of "true" in the description of type I and II errors. An error of type I is defined as the rejection of the null-hypothesis when it is "true". But what does "true" mean in this context? Of course, it is not difficult to grasp intuitively the meaning that the authors wish to convey: evidently, they suppose that there is some ontological sense in which a hypothesis may be conceived as true (or false), even though the experimenter does not know the truth. One might attempt to escape the completely intuitive meaning of "true" by describing the situation somewhat as follows: imagine a number of experimenters making tests similar to that described above on the yield of corn seed. Each experimenter makes essentially the same kind of test, and collects sets of observations falling into similar groups. If the number of experiments of this sort were increased indefinitely, then among all the possible methods of making inferences from the various sets of data,

that provided by the Pearson-Neyman theory would result in the least number of wrong inferences. The *right* inference would be the limit approached by the total number of observations as the number is increased without limit. That is, the concept "true", and the concept "best test" are defined in terms of a construct of nature that pictures an infinite sequence of experiments that are similar, and whose cumulative results approach a limit. Statisticians frequently call the limit approached by a certain (controlled) set of observations the "stochastic" limit, to distinguish it from mathematical limits; philosophers might well borrow Kant's terms, as E. A. Singer had done, and call this limit a *grenz-begriff*, a "limiting concept".

Several interesting questions arise in connection with this description of the basis of statistical tests. The obvious sceptical position would be to ask by what right the experimenter can talk of such a natural construct, when by its very nature he can never provide evidence for its existence. That is, even though our observations appear to approach a limit, any set of observations is, after all, finite, and to argue from the properties of a finite set to those of an infinite one of which it is a subset is always a spurious argument.

The sceptic's objection can perhaps best be answered in the Kantian manner: were such a construct denied, then so also must be denied inferences from observations; indeed, since all "observations" are themselves inferential entities, if such a construct were denied, then so also would be all experimental knowledge, whether particular or general. Thus the construct becomes a necessary *a priori* to all experimental inquiry. But even if one is satisfied with this answer, other problems of equivalent difficulty remain. For example what sort of nature must the experimenter presuppose when he argues that his stochastic limit exists? That is *if* he argues that as the number of observations is increased without limit, it is possible (under controlled conditions) to approach a limit, then he must assert the existence in nature of such a limit. What formal conditions does this impose (if any) on his mechanics, say?

So far as the writer knows, the only exact formal treatment of problems of this type is to be found in the lectures of E. A. Singer, Jr. Singer's solution, designated as Experimentalism, could hardly be even outlined within the scope of this paper, but its salient features can be summarized thus: 1) an experimental test without formal presuppositions does not exist; 2) the formal presuppositions necessary to apply a statistical test of the sort discussed here may be regarded as the null-hypothesis in its most general form: they involve all the conditions assumed by the experimenter in making and adjusting his observations and in applying his mathematics; 3) the rejection of the null-hypothesis may consist of a

rejection in any part of the formal structure, and not just in a distribution assumption; 4) the criterion of rejection would be just that offered by a Pearson-Neyman theory; 5) the "true value" is the limit of an infinite set of observations made under the acceptable null-hypothesis (the "stochastic" limit or *Grenzbegriff*); 6) the formal presuppositions of the experimenter must be sufficient to establish the existence of the stochastic limit. This point is especially important with respect to recent physical theory; if, as is sometimes suggested, one interprets the Heisenberg indeterminacy principle to imply that stochastic limits do not exist for certain physical constants, then the pertinent question is what an "error" in the measurement of this constant can mean. If the true value does not exist, then in what sense do the errors exist? Either one must abandon the term "error" in this connection, or else abandon *this* interpretation of the Heisenberg principle.

These are all too inadequate summaries of Singer's position, but they do help to show that his research is directed towards those matters which Pearson and Neyman, rightly enough, take for granted in their theory.

To sum up, we have defined the fundamental non-formal problem of science as that of making the most powerful inferences from observations. We have shown that the recent solution of this problem offered by Pearson and Neyman makes clear the fundamental problem to be considered by the philosopher of science: the exact nature of the generalized "null-hypothesis", which will include all the formal presuppositions that are necessary in order to make observations and conduct tests upon them.

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REVIEWS OF BOOKS

PSYCHOLOGY AND LOGIC. By J. R. Kantor. Bloomington, Ind., The Principia Press, 1945. Pp. xviii, 364.

The title of this work calls attention to an important problem which psychologists and logicians are far too content to ignore, but which must nevertheless constantly haunt the backs of their minds as they go about their daily labors. Professor Kantor deserves great credit for frankly bringing this problem out into the open, from the side of psychology, and it is to be hoped that his bold example will soon be followed by some logician able to treat it from the side of logic. In practice philosophers in general and logicians in particular often either write their own psychologies as they go along, or just adopt whatever extant type of psychological theory seemingly best accords with their own theories and doctrines. Some logicians, indeed, with truly lordly presumption, but with far less insight into the workings of their own minds, preface their logical theories with the proud assertion that logic, as such, 'has nothing to do with psychology'—and forthwith proceed to enunciate a series of the crudest sort of psychological dogmas; or, what if possible is worse yet, tacitly assume them, unawares. And yet another group of logicians go to the other extreme of construing logic simply as a branch or application of psychology to a specific set of problems. In any case professional psychologists may be counted on to label the results 'armchair psychology', to distinguish them as sharply as possible from their own findings, presumably attained by faithful adherence to scientific methods and criteria of investigation. So obsessed indeed—for verily 'obsessed' is not too strong a word—are many psychologists with the need or urge to be 'scientific' at all costs, and to the very end, that they are much inclined to look upon all philosophy with frank suspicion if not with downright hostility. And while this attitude is easily understandable as a psychological phenomenon, due partly to historical circumstances, partly to simple human fear of the treacherous

unknown, it is nevertheless exceedingly unfortunate for all concerned. Certainly the open, hearty cooperation for which Professor Kantor pleads, and not veiled hostility, not intellectual isolationism, is what alone will lead to the eventual solution of the numerous borderline problems between the two special fields of logic and psychology (Ch. V).

But Professor Kantor's work, which he plans to complete in another volume, has a far wider sweep and far more ambitious aims, both critical and constructive, than its simple title clearly suggests. A very brief historical survey of what the author calls "some characteristic successions of logical doctrine" from Aristotle to the recent past (Ch. III) is followed by a complementary chapter on four "representative trends in contemporary logic", and numerous allusions to the views of this, that, and the other logician are generously scattered throughout the volume.

On its negative or critical side Professor Kantor's thesis is that throughout its long history logic has been far too largely dominated by "traditional metaphysics" and by "undiscerned cultural influences". Add to these tremendous handicaps the fact that up until this very day logical doctrines have been "based [either] upon a mentalistic psychology" of one sort or another, or upon a psychology concerned merely with "the biological activities of organisms", and the wonder is, not that logic has made some progress and had some success in wrestling with its specific problems, but that it has somehow managed to survive at all as a self-respecting "human enterprise". The well-nigh disastrous result has been a succession of logical theories based upon the "unsatisfactory assumptions that logic is infallible, comprehensive, and transcendent" (xvii).

What then is to be done, what is to replace this complex of mistaken theories and misguided efforts with which logic has for so long been afflicted? It is with this question that the main constructive part of the present volume has to do. From what has gone before, it should be clear that the author has committed himself in effect to no less formidable a task than that of completely rebuilding both logic and psychology, from the ground up, though of course utilizing in the process whatever can be salvaged from the wreckage of the past.

Fortunately, however, Professor Kantor and his associates have already done much towards the construction of what he maintains is a genuinely scientific psychology—the essential counterpart of a no less genuinely scientific logic-to-be. According to this authority, all science deals with "specific forms of interrelations between objects or events" (151), and psychology in particular investigates the "interrelations of organisms and particular stimulus objects which may be other organisms, inorganic things, relations or other cultural and non-cultural events" (140). Since "these interactions constitute fields or situations" in which

the actions of both individuals and objects, and "the settings or circumstances under which the interactions take place" are the important factors, psychology may be defined as "the science of interbehavior fields" (140) and these interbehavioral fields "must be described in terms of coordinate response and stimulus functions". Thus in this context the individual person "is simply an enormously large sum of response functions" localized in the activities of persons, "which are coordinate with an equal number of stimulus functions", localized in specific objects (141).

In the light of this psychology it becomes possible for the first time, so the author contends, clearly to grasp the nature of that species of interbehavior properly to be denominated as logical. Whether the logician conceives himself to be occupied with symbols and their interrelations, or with propositions and their manipulation according to some plan of necessary deductive inference, or with scientific methods and induction, or with instrumental procedures and techniques, or with cosmic dialectics, or with various combinations of such typical undertakings, he is really always engaged in a specific system building enterprise of one sort or another. *All logic is system building*—such is the one generalization about the science for which there is ample justification both by its history and by contemporary theories.

The first implication of this general presupposition, is, paradoxically enough, that to all intents and purposes there is no such thing as logic in general, but rather that there are logics and logics. That is to say, system building involves three equally basic factors, all of which may vary indefinitely, thus giving rise to various species of logic, namely, the materials used in the construction, the processes or operations by which the construction is carried on, and the finished products, the specific systems constructed for specific purposes. Thus "to believe that there is only one logic or that logic is a universal system is simply blinding oneself to the actual facts of reasoning and other logical operations" (11). ". . . logic is no more a philosophical than a scientific, a technological or a commercial discipline. In no sense does it have any exclusive subject matter [material], technique, or products" (8). ". . . as in the popular references to the logic of archaeological construction or the logic of curriculum making, any form of systematization of actions, objects, or events constitutes logical work" (8).

In sum, then, the author claims for his logical pluralism, as it might perhaps be called, three virtues not attaching in the same degree to any other logical theory, past or present: (1) Detachment from entangling alliances with metaphysics and other extraneous cultural influences. (2) Cooperative association with a (and perhaps *the only!*) genuinely scien-

tific psychology. (3) Conformity with the unsophisticated natural use of such words as 'logic', 'logical' and 'logically' in all sorts of contexts, most of which usages are only too studiously ignored by the professional logicians.

What is to be said for these rather bold and sweeping claims? Singly or together, the first two, as every philosopher knows only too well, have been advanced many times before. Indeed, it is hardly too much to say that the first—namely, detachment from metaphysics—is one of the favorite illusions of many intellectual adventurers, witness the logical positivists and the instrumental logicians of the present time. But it seems that something has gone wrong somewhere, for one of the prime advantages supposedly accruing from this detachment is the substantial agreement amongst all hands which would thereupon automatically ensue. If only metaphysicians would listen to reason and give up their abstract and futile wrangling, and join with other scientists—such is the conviction—then all would be peace and harmony and progress unbounded. So say the logical positivists; so say the instrumentalists; so says Professor Kantor! Yet each disagrees with the other, quite as heartily as do the old fashioned metaphysicians, and each means by science something different, and there is no harmony, and progress—progress is left to take care of itself. Can it be that in the attempt to avoid the unavoidable one only becomes the more closely entangled therein? It almost seems so. *L'homme est métaphysicien tant qu'il respire*—so says Meyerson. At all events, if there were any good reason for doing so, it would not be too difficult to set out the philosophical presuppositions underlying Professor Kantor's own work.

As for the second claim, namely that interbehavioral psychology is the only truly scientific psychology, the author must realize that formidable, not to say bitter opposition, rather than support, is all that he can anticipate from the majority of his fellow psychologists, with respect to it. Under such circumstances, the logician can hardly be blamed if he hesitates to commit himself unreservedly to the specific psychological doctrines Professor Kantor so persuasively sets forth. And in mere self defense he must even reserve the right to criticize such of those doctrines as seem to conflict with fundamental logical principles. In particular, if the only logical principle is that there are no infallible logical principles, then how can Professor Kantor expect anyone to accept as true, or valid, or even to consider at all seriously, his own logical theories—or for that matter, his own psychology?

But it is a dreary task, if a very essential one, to call attention, however briefly, to the hoary fallacies implicit in such anti-metaphysical and relativistic doctrines. Having duly discharged this unwelcome obligation,

attention may now be directed more specifically to Professor Kantor's positive conception of logic as system building.

With respect to that conception, perhaps the first observation that naturally occurs to one is that it at least conforms pretty well to rather vague popular verbal usages. There is indeed, or so it seems, some sort of a 'logic' to anything and everything, a *rationale*, a 'go', to every phase, aspect, and variety of what Professor Kantor calls "interbehavior". Thus it is customary to speak of a logic of events, of a given situation or state of affairs, of the law, of a specific science, of language, of grammar. . . . In most, if not in all of these cases, and frequently in the author's own usage, the term 'logic' is practically synonymous with the term 'principles' as used in such phrases as the principles of economics, of the gasoline engine, of marine architecture. But such loose usage does not satisfy very well the more precise requirements of scientists and philosophers, and, tacitly recognizing this fact, the author introduces distinctions between science and logic, and between logical theory and logical practice, in order to meet those requirements to the best of his ability.

According to this authority, science differs from logic in two important respects. 1. Scientific operations consist for the most part of "observations and manipulations which are basic to all interpretation and system construction", whereas logical operations consist "of the construction of systems, whether of things, events, knowledge, statements, relations, or any other sort of interrelatable materials" (230). 2. Similarly, scientific products consist "of a series of equations or formulae which describe and sum up as well as indicate the consequences of . . . operations", whereas the logical product, or system, "comprises a well-rounded structure or organization which may be described in verbal or symbolic form" (230). Thus in any "scientific system" the stress is upon "the objects and events interbehaved with", while in any "logical system" it is "upon the systematizing procedure".

It is obvious that on this unique view the scope of science is much narrower than it is ordinarily taken to be, while the scope of logic is proportionately enlarged. But it is difficult to see how, in the last analysis, such distinctions as the foregoing can be more than relative, more than a matter of degree, rather than one of kind. For as soon as a science has passed beyond its most elementary, groping stage, the work of system building, which according to the Kantorean thesis is logical work, explicitly begins. And this interpretation is confirmed by the fact that the same continuity is actually recognized so far as the cognate distinction between logical theory and logical practice is concerned. For the former is distinguished from the latter simply in that the one "constitutes the examination or study of operations" whereas the other

"consists of those operations themselves". And such a study, involving theorizing, thinking, reasoning, etc., is itself "a series of organizational operations" (4, 5). "Intellectual behavior" is just as much "the interbehavior of individuals with objects" as are all the "various sorts of concrete manipulations". Thus "there is no difference in principle between the practical organization of objects and the most technical or abstract logical procedures" (5). Nevertheless it is true that logical theorizing is somewhat more general than specific system building. "Whereas the primary system builder adopts certain premises on the basis of patent conditions and immediate interests, the theorist is concerned with an understanding and comparison of all the different premises and reference frames employed by particular system builders, whether they build in a particular (legal, scientific, commercial, mathematical) or general (some form of traditional logic) field. Specifically the logical theorist is interested in comparing the operations and products or results of a biologist developing a system of biology, a mathematician organizing a postulate-theorem structure, a logician creating a local scientific or symbolic system of propositions or a structure of sentences to achieve a cosmic order whether it includes or excludes metaphysical features" (297).

Note especially that this theoretical investigation and analysis of logical enterprises applies not only to such specific systems as the science of biology, or a commercial institution, but also to all other types of logical theory as well—symbolic, dialectical, instrumental, or what not. In sum, Professor Kantor claims to be merely an impartial "investigator who studies the logician and his interbehavior in the way a naturalist observes the adjustments of an organism to its environment" (297). And upon this ground he professes to have established for the first time a truly adequate, philosophically and culturally unbiassed criterion for evaluating system building of all kinds.

The hostile critic will at once rise to object that such a thesis is manifestly selfcontradictory. In one and the same breath it denies and affirms general logical principles. That there is no one general and absolute system of logic is a theme upon which the author constantly harps. And that any special logical theory rests upon specific, *ad hoc* assumptions or postulates he explicitly teaches (Ch. I). How, then, can he at the same time advance claims of generality for his interbehavioral logic which he denies, not only to all other existing types of logical theory, but *in principle*, or to any possible theory?

In the opinion of the present writer Professor Kantor's answer to this crucial question is far from clear, far from being wholly satisfactory. This is not to say, however, that such pretensions are entirely unjustified.

A logical theory which so to speak takes all system building for its province is, indeed, by very definition, all inclusive, or it is nothing. And as compared with certain other theories, past and present, the author succeeds in showing that they in fact are less comprehensive, and more one-sided, than his own. But in the explicit admission that such a theory is itself a system, "in principle" like any other, he can hardly avoid being caught on the horns of a nasty dilemma. Either he must frankly confess, along with certain other contemporary logicians, that he finds himself in the toils of the so-called logocentric predicament,[1] or else he must concede that his theory spins itself out in an endless regress. And signs are not wanting that he is himself more than a little uneasy over this state of affairs. Admitting that his interbehavioral or "specificity logic", like all other theories, rests on certain postulates or presuppositions, and admitting too that "all postulates . . . require justification", he weakly adds that the need for his postulates is "based on the assumption that other postulates are not found to be sufficient or satisfactory" (1, 2). Not sufficient or satisfactory in terms of his own criteria, naturally; but how justify these criteria themselves? By their dogmatic reassertion, supported only by his own special brand of psychology? Having definitely rejected metaphysics, what other alternative is open to him? At any rate he offers no other one. And with respect to the second horn of the dilemma, he simply asserts, dogmatically once more, that the series of "organizational operations", of which logical theory as well as logical practice is composed, "is strictly limited in range and does not involve any objectionable regress. . . . At most, we might perhaps add as the last of the series the behavior of the student of the abstract products of logical theories" (5). But actually what is there in principle to contemplate here, save a never ending series of students of correspondingly more and more abstract products?

A more particular difficulty concerns the relation of psychology to logic—the very matter the author is most directly committed to clearing up. In fact Professor Kantor does not, and on his premises logically cannot define this relation in accordance with the way in which he draws the (relative) distinction between the other special sciences and logic. For while, like the other sciences, "psychology is subject to rules of logic", logic, unlike those other sciences, "is likewise subject to psychological laws" (13). There is thus something inevitably anomalous about this state of affairs, in that psychology on this view both is and is not one special science on a par with all of the others. "System building", which is logic, is only one species of "interbehavior", and the study of

[1] *Cf.* a discussion by the present writer entitled "The Alleged Predicament of Logic" in the *Journal of Philosophy*, XLI, 22, Oct. 26, 1944, pp. 598-604.

"interbehavioral fields" in general is psychology. But then psychology is a science, and accordingly, in all but its most elementary phases, only one species of system building, *i.e.*, of logic, among and strictly on a par with, all of the others.

Unfortunately these are by no means the only difficulties and defects inherent in both the critical and the constructive portions of Professor Kantor's book. To put it bluntly, the whole work is inexcusably repetitious, confused, and dogmatic in tone—the very model, in these respects, of what such a work should not be. From his critical comments it is obvious that the author had read widely, but not too well, in the field of logic. For many of these criticisms are based upon evident misinterpretations of the theories in question, or upon criteria logically inapplicable to those theories. And on the constructive side he is far too eager to gloss over or to ignore entirely the difficulties inherent in his own position. For the rest, the book contains an extensive bibliography and a good index, but, rather oddly, no indication of the contents of the projected second volume.

H. R. SMART

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THE UNDERSTANDING OF MUSIC. By MAX SCHOEN. New York, Harper and Brothers, 1945. Pp. ix, 187.

We must be grateful to the author of this little book for giving us a serious work which is not just another book on "music appreciation". It is a laudable attempt to provide a truly esthetic basis and explanation for what its author considers "understanding" music. In four chapters or essays on "What Art Is", "The Art in Music", "The Musical Hearing of Music", and "Education for the Esthetic Perception of Music", the difficult problem of what really happens when we "understand" music is considered.

In many points, though not (in this reviewer's opinion) in all, the treatment is adequate and successful. Intelligent, music-loving laymen, and musicians who are willing to think about their art, can follow easily and profit greatly from the author's explanation of the diffierences between "the world of the practical", "the world of the scientific", and "the the world of the esthetic", a necessary clarification for the approach to any esthetic thinking, one that is particularly needed in the field of music. The problem receives scant or muddled treatment in the average book on music appreciation.

The detailed working out of the author's esthetic theory offers many pages that cannot fail to arouse a thoughtful reader's interest, as, for

instance, the critical discussion of Walter Pater's theory of art. But when we apply the test of strict logical or philosophic principles, some of the weak spots in the presentation come to light. For example, Dr. Schoen's system is a pure and outspoken "form" esthetic. Form is the saving grace of the theory. With this word the author attempts to perform white magic, and before one reaches the end of the book one is a little puzzled as to what the author really means by this word. It is nowhere clearly defined.

What Hanslick, in his epoch-making essay "On the Beautiful in Music", meant by his esthetics of "tonal moving forms" is reasonably clear. But in the work under discussion, form is variously equated with: "natural phenomena", "the objectively given", "abstract experience", "the product of the imaginative process of abstracting", 'the reality, the truth of all objects of experience", "pure experience", "pure reality", "objective reality". "An automobile is beautiful because of its appearance, which is a form, and where the motor runs beautifully, the reference is likewise to the way it operates, which is a form." "Where the artist is working he has nothing in mind but the drive to create a perfect form." "Beauty is the feeling for form as form." "A beautiful idea" is "prized for what it is. It has intrinsic value, and as intrinsic it is a form." "It is in and by the 'imaginative reason' that form and matter become identified, since pure sense is form only, and pure matter is intellect only." "Music has such reposeful influence on strong feeling, which means that it makes feeling for form predominate over feeling for matter, because all its material, from the single tone to the melody, is form." "A single tone is already a perfect form, and the only response to it is perfect feeling. There is nothing in the tone as such to arouse feeling but the tone itself. Matter and form are here identical." "The matter of harmony, like that of melody, is form and form only. We thus find that the very matter of the material of music is form."

With such a protean word the most difficult and abstract problems of esthetics can be solved—on paper, but the solution leaves the reader bewildered.

Aside from this shortcoming in the matter of a clearly and completely established system, there is, as we have indicated, much sense in many of the author's remarks. Now and again debatable points are raised. Dr. Schoen is not a tyro in matters of psychology, but not all psychologists will agree with his judgment about "vision being biologically the most superficial of the senses, because it is least important for survival. The senses that touch life most clearly are, in order of increasing importance, smell, taste and hearing". And there are surely many musicians and music critics who will not agree that Wagner "is a musician only in those

interludes in his music-dramas when the dramatic element comes to a standstill. He becomes a composer as such only on the concert stage".

The last chapter, "Education for the Esthetic Perception of Music", will also leave some readers unsatisfied. In his zeal for the establishment, between the work of musical art and the hearer, of a relation involving nothing but pure feeling for pure form, with no admixture of any rational or intellectual factor, the author repudiates utterly certain pedagogical devices which have often been used to arouse in untrained hearers an interest in listening to music. These are the ways of familiarity, of analysis, and of interpretation. It is quite true that these methods of approach have suffered abuse that is little short of appalling. But pedagogy is not a matter of pure feeling. Understanding—the word is used in the very title of the book—is still a matter of the intellect. Familiarity, resulting from repeated hearing, is the only basis for sound and lasting musical judgment, and is especially necessary for the beginner. Analysis (not mere mechanical dissection) is the only method of approach to the understanding of any but the simplest and most elementary forms. Interpretation, exegesis, hermeneutic, has been and still is the most successful method of teaching an appreciation of poetry and literature in general. That it is far more difficult to apply this method wisely to the immaterial, non-representative art of music is no indictment of the method as such. Judicious teachers will probably still resort to these leading strings or crutches. Incompetent teachers will still continue to abuse them. For our author has given us no clear-cut explanation of a substitute, no direct formulation of a practical, pedagogic method for teaching a beginner how to arrive at the pure and uncontaminated esthetic action which is the subject of his book.

OTTO KINKELDEY

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ΜΑΡΚΟΥ ΑΝΤΩΝΙΝΟΥ ΑΥΤΟΚΡΑΤΟΡΟΣ ΤΑ ΕΙΣ ΕΑΥΤΟΝ. *THE MEDITATIONS OF THE EMPEROR MARCUS ANTONINUS.*

Edited with translation and commentary by A. S. L. FARQUHARSON (1871-1942). Oxford: at the Clarendon Press, 1944. 2 vols. Vol. I: pp. lxxxiii, 431. Vol. II: pp. 503 (numbered 433-935).

There has probably been no scholar of recent times better fitted to edit and interpret the meditations of the Stoic Emperor than the late Dr. Farquharson. Completed not until his death at the age of seventy-one, it represents the fruit of a lifetime of interest in the subject, as Major John Sparrow has demonstrated by the evidence of Farquharson's library—"the hundreds of volumes bearing in their margins copious notes

and forests of cross-references, written in his delicate, even hand and dating, some of them, from his undergraduate days". The care with which he undertook the work is further attested, again on Sparrow's evidence, by the "many drafts of passages of exegesis and annotation—discarded, resumed, altered, discarded, and again adopted" which were found among his remains. Although he did not live to see the actual publication of his work, he bequeathed a manuscript entirely ready for the press and had corrected all of Volume I and much of Volume II in proof. Acknowledgment should be made of the devoted work of Major Sparrow and Mr. David Rees in seeing the volume through the press during the difficult conditions of wartime.

The arrangement of materials in the two volumes is admirable. Volume I comprises an Introduction tracing the history of the text, its previous editions and translations, theories of the proper order of the Books and chapters, and an all too brief comparison of the *Meditations* with other books of spiritual consolation; a newly emended Greek text with full 'apparatus' on the left-hand pages and a new English translation on the right; a detailed 'English commentary'; short chronological and genealogical tables; a life of the emperor-philosopher; and a bibliography limited to classical authors on the one hand and contributors to the history and criticism of the text on the other. (A general bibliography, perhaps owing to the circumstances of publication, is lacking.) Volume II consists of 469 pages of commentary on the Greek text, followed by Indexes.

In respect of literal accuracy the new translation is nearly flawless, and therefore the most suitable kind of translation to appear in juxtaposition to a Greek text. Although the greater accuracy does not alter in any major respect the interpretation of Marcus' philosophy, it furnishes numerous clarifications and incidentally rescues his adoptive father, the Emperor Antoninus Pius, from possible obloquy. The phrase τὸ παῦσαι τὰ περὶ τοὺς ἔρωτας τῶν μειρακίων cannot mean "that he had overcome all passion for boys" (George Long's translation, in *The Stoic and Epicurean Philosophers*) nor, more vaguely, "chaste habits" (Rendall, in the Golden Treasury Series). If the practices indicated by the last four Greek words had been ascribed to Antoninus Pius himself, the verb would have been put in the middle voice. Hence Farquharson's translation, "prohibition of unnatural practices" is probably correct so far as the ascription goes, although his vagueness as to what was prohibited seems a piece of mild prudery in a translation that is elsewhere so meticulously exact.

In the more philosophical passages questions of literal accuracy are less easily settled. Take, for instance, the important word ὑπόληψις, which

Farquharson translates 'judgment' in contrast to Long's word 'opinion'. In certain passages, where the emphasis is on canceling or casting away (*e.g.*, VIII. 40; XII. 1; XII. 25), Long's translation is evidently preferable. (Farquharson deals with some of these instances by specifying in the Greek commentary that *mistaken* judgment is meant.) Elsewhere it appears that 'judgment' is the better word to use, connoting as it does the active, rational character of man's conception-making faculty. Marcus' repeated πάντα ὑπόληψις suggests the bankruptcy of knowledge when translated into Long's phrase, "Everything is opinion". When the object of ὑπόληψις is *oneself*, as notably in XII. 4, the word clearly refers to that judging activity, at once intellectual and moral, which is *conscientia* (*cf.* p. 886: note on 238, line 8).

In any event literal accuracy, while valuable for one's reference shelf, is not always the best technique for the communication of philosophical ideas. "For we are made for coöperation"—this phrase contributed by Long and adopted *verbatim* by Rendall, is surely a more effective rendering of γεγόναμεν γὰρ πρὸς συνεργίαν than Farquharson's "for we have come into the world to work together". It is less accurate? I do not think so. Although "we are made" might appear to connote an external agency, which is absent from the neuter verb γεγόναμεν, the reader with an eye for context will not be misled; and 'coöperation', besides being linguistically parallel, retains the succinctness of the original. The older translation has here the force of an epigram, which accentuates without distorting the original idea. Occasionally, it should be noted, the stylistic advantage lies on Farquharson's side. "Wilt thou one day, my soul, be good, simple, single, naked, plainer to see than the body surrounding thee?" (X. 1) is excellent, and avoids the adventitious pessimism of Long, who renders ποτέ by 'never'.

The English Commentary furnishes, besides chapter-by-chapter (*i.e.*, paragraph-by-paragraph) interpretations of Marcus' thought, an introduction to each Book, at once summarizing its content and characterizing its tone. One offspring of these analysis is a hypothesis, which Farquharson offers with diffidence (279), that Books II, III, and XII were the original draft out of which the entire *Meditations* later grew. The argument adduced is their kinship in matter and manner, particularly their stress on the indwelling Genius (δαίμων), which is mentioned rarely in the other Books. Moreover, the argument continues, a number of the chapters of Book XII appear to be mere jottings of ideas set down for later consideration, three of them prefaced by ὅτι, "which is usually the mark of an extract, and a condensed extract, from some other source" (419). Now with all respect to Farquharson's erudition I would dissent from this interpretation of ὅτι. It appears to me that in some passages

where the word stands at the beginning of an entry, as in chs. 21 and 22 of Book XII, the verb θεάσασθαι ('consider!') or some synonym is to be understood—*cf.* XII. 8, where this verb in this form occurs followed by a series of indirect questions and finally by a semi-isolated ὅτι clause. Moreover, whatever may be supposed about the rest of Book XII, it would appear that its concluding chapter, as Farquharson later remarks, "is clearly intended for its place, at the end of a Book, if not at the close of the whole *Meditations*".

What, then, shall we infer? That Book XII is partly an appendix of the Emperor's earlier notes for moral reflexion, to which the original editor—Marcus' freedman Chryseros? his Greek secretary Alexander? or someone who has left no personal trace? (*cf.* Vol. I, p. xiii)—saw fit to attach the last chapters, which by their more pronouncedly religious character and emphasis on death may have struck him as a suitable conclusion to the entire work? It seems an odd way of editing but one cannot be sure. Any argument against the integrity of Book XII based on the fragmentary character of some of its entries could be urged with perhaps equal force against parts of several of the other Books. In a work intended only for the furtherance of private reflexion, as TA ΕΙΣ ΕΑΥΤΟΝ undoubtedly was, and compiled during the quiet moments of a busy life, some inclusion of the fragmentary and the irrelevant is to be expected, nor does its presence necessarily indicate editorial tampering. In view of the ambiguous evidence it is well that Farquharson has retained the canonical order. It is the best order, not only because it has become the accustomed one for generations of readers but also because it is the order imposed either by Marcus himself or by an editor who was nearer to him and understood him more intimately than any modern scholar can hope to do. Surely it was a wise and devoted editor who saw the fitness of bringing the master's reflexions to a close with the memorable words, "Leave the stage, therefore, and be reconciled, for He also who lets his servant depart is reconciled". For this is the crowning utterance, as the *Meditations* are the extended testament, of one who had reconciled master and servant, actor and audience, sage and saint, within his own benign person.

PHILIP WHEELWRIGHT

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University of Colorado Studies, Series B: Studies in the Humanities. II, 3: THE QUEST OF AMERICAN LIFE. By GEORGE NORLIN. Boulder, Colorado, University of Colorado, 1945. Pp. xvi, 280.

When Dr. Norlin retired from the presidency of the University of Colorado in 1939 he continued to serve the University as Research Pro-

fessor in the Humanities. *The Quest of American Life,* the last book to come from his pen, is a product not only of these final years but also of his life as a whole. It traces what he called the "humanistic" tradition in the development of our country, with particular emphasis on the influence of the frontier on our intellectual and political struggle for democracy. This tradition he describes as "a sense of fellowship of the human spirit through the ages . . . an attitude of mind and heart which holds to the preciousness of human life" (vii), the steadily clearer application of the Golden Rule.

Roger Williams, our first great humanist, fought for the freedoms which are familiar to liberals today: freedom to worship, to think and inquire, to debate and publish, to petition and assemble and combine with others in a common cause. There follows the line of great protectors of the dignity and worth of the individual: John Woolman, Thomas Jefferson, Thomas Paine, Andrew Jackson, Abraham Lincoln. The chapters on these men and on the crucial Civil War struggle are eloquent, the best in the book. Our unique struggle to aid the common man has seldom been described with such fervid faith in its importance.

The final part of this work seems to have been hurried and is sadly incomplete. In two hundred and forty pages the reader is taken to the end of the Civil War, and the remaining thirty pages only are left to bring our intellectual history and fight for freedom up to date. It comes as a shock to find the defense of American humanism since the time of Lincoln entrusted almost exclusively to Theodore Roosevelt. No mention of Henry George or Jane Addams or Eugene V. Debs—or of the Civil Liberties Union. Henry David Thoreau and Woodrow Wilson are referred to only in passing! The great twentieth century fight against economic slavery is acknowledged, but never adequately described.

This is in a sense a personal book. It suffers the disadvantage of falling between better accounts of American political philosophy and better histories of our political and social struggles, yet has the advantage of bringing the two together. It is not difficult to believe that to those who knew Dr. Norlin intimately it bears the sure mark of his personality and his ideals and will be cherished for these things.

ROGER W. HOLMES

Mt. Holyoke

ARE MEN EQUAL? An Inquiry into the Meaning of American Democracy. By HENRY ALONZO MYERS. New York, G. P. Putnam's Sons, 1945. Pp. x, 188.

Many of our colleges and universities have recently established undergraduate and graduate programs in "American Civilization". The ra-

tionale of such programs is obvious and plausible. In practice, they often amount to no more than catalog juxtapositions of previous courses in American literature, history, government, and society, and perhaps philosophy, art, science, or technology. There are few attempts at integration or correlation. It usually turns out that "American" is only a geographic designation.

If there are teachers and students in such programs who feel the need of bringing the various courses to a common focus, Professor Myers can help them. He finds in human equality the central theme of American literature and sees American history and civilization as a great proving ground for the theory and practice of that "standard justice of equal private rights" on which alone a democratic world community can be established. The larger and better part of his book is an eloquent, indeed an inspiring, interpretation of American literature and history from this point of view.

At the beginning and end, however, Mr. Myers, a teacher of literature by calling but a philosopher by training, attempts a philosophic answer to the question of his title, "*are* men equal?" (Not, of course, in physical strength, or skill, or knowledge, or moral goodness, actual or potential, but in "ultimate worth".) He disposes readily enough of the arguments to the contrary. He rests his case for the affirmative on these three considerations:

1. The proposition of equality has been pragmatically verified by the American experiment. It has proved true by making good.

2. "Each man is to himself equal to the great world of his own experience. In what matters most to men this world has the same import to all; it teaches each the lesson of his own infinite worth. And so men, who are equal to the same thing, are equal to each other. One being of infinite worth cannot be greater or less than another of infinite worth" (32).

3. By a "universal and inevitable justice" (164), "suffering and joy, eternally necessary aspects of human awareness, are balanced in the life of every individual" (166). This equal fate, insured by the law of compensation, argues equal worth.

The interpretation of our political history may be taken as illustrating the first argument, and that of our literature as illustrating the second and third.

The arguments themselves have a rhetorical and homiletic color suited to the unofficial chaplaincy which in most of our institutions of higher learning has passed, in the last generation or two, from the department of philosophy to that of English.

One wonders if the author, as a philosopher, has tried taking the idea of equality in Kantian fashion as a postulate or regulative principle, or approaching it by way of the theory of value.

Mr. Myers's *bête noire* is the idea of progress in all its forms, especially the Marxist. As one equalitarian to another, I should say he might have strengthened his book by meeting squarely the Marxist critique of bourgeois equalitarianism. A fair statement of that critique may be found in Vernon Venable's *Human Nature: the Marxist View* (pp. 204-213).

MAX H. FISCH

Army Medical Library

BASIC WRITINGS OF SAINT THOMAS AQUINAS. Edited and annotated with an introduction by A. C. PEGIS. New York, Random House, 1945. 2 volumes. Pp. liii, 1097; xxxi, 1179.

Since the publication of these two admirable volumes, no English speaking student of philosophy can now remain invincibly ignorant of the work of St. Thomas. The magnitude of the work may, of course, repel some, and impel others to thumb through it superficially.

Volume I, "God and the Order of Creation", comprises the entire Part I of the *Summa Theologica;* volume II, "Man and the Conduct of Life", contains Part III, chapters 1-113, of the *Summa contra Gentiles,* certain questions from the First Part of the Second Part of the *Summa Theologica* and, happily enough, seven questions on faith from the Second Part of the Second Part. To criticize the selection of such massive and basic sections from the two principal works of St. Thomas would be idle; hence, only a descriptive notice of the two volumes is possible for this reviewer.

In addition to the text, Professor Pegis has supplied an index of the various notions that St. Thomas either quotes from or attributes to the writers whom he is citing. These references are arranged doctrinally under the names of the writers. This index, together with the footnotes in the text to the particular passages cited by St. Thomas, enable the reader to appreciate the extensive philosophical and theological background presupposed by St. Thomas' writing. These annotations are based on the work of the editors of the Ottawa-Piana edition of the *Summa Theologica* and the Leonine edition of the *Summa contra Gentiles.* The text itself is an occasionally changed version of the English Dominican translation done by Father Laurence Shapcote.

In the introduction, Professor Pegis seems prinicipally concerned to show that the philosophy of St. Thomas is distinctive because it exhibits a philosophical understanding of the history of philosophy. Such understanding "involves nothing less than the discovery of philosophy itself. Only he who knows philosophy can see the history of philosophy in its light" (xliii). Though it is difficult to understand the generalities and

elusive language of the author, the present reader is left with the impression that, according to Pegis, St. Thomas has propounded the most nearly final answers to most philosophical problems. This impression is reinforced by the disparagement of other medieval philosophers, many of whom, according to Pegis, have interpreted reality by conceptual abstractions, thus erecting a barrier of essences between thought and the world of sense. "Whether Duns Scotus, for example, ever crossed that barrier, except in the entirely Platonic sense of making the being of things to the image of being as it is thought, is, to say the least, an embarrassing issue for the historian of the great Franciscan thinker" (xlvii). Strangely enough, the many Franciscans who have made a careful study of the work of Duns Scotus do not seem at all embarrassed by their great predecessor.

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THE FOLLOWING BOOKS HAVE BEEN RECEIVED:

Philosophy in American Education. Its Tasks and Opportunities. By BRAND BLANSHARD, CURT J. DUCASSE, CHARLES W. HENDEL, ARTHUR E. MURPHY, and MAX C. OTTO. New York and London, Harper & Brothers Publishers, 1945. Pp. xiii, 306.

University of New Mexico Publications in the Humanities, I: *Time as Dimension and History.* By HUBERT GRIGGS ALEXANDER. Albuquerque, The University of New Mexico Press, 1945. Pp. 134.

Proceedings of the Cambridge Philosophical Society, XLI, Part 2. London, Cambridge University Press, 1945. Pp. 77-186.

Our Knowledge of Universals. By R. I. AARON. Annual Philosophical Lecture, Henriette Hertz Trust, British Academy, 1945. London, Humphrey Milford, 1945. (Oxford University Press, New York 11, N.Y.) Pp. 28.

Rosenberg's Nazi Myth. By ALBERT R. CHANDLER. Ithaca, N.Y., Cornell University Press, 1945. Pp. x, 146.

Some Modern Guides to Faith. By WILLIAM ROBBINS. Reprinted from The *University of Toronto Quarterly,* Vol. XIV, No. 4, July 1945. Pp. 375-392.

Return to an Old Book. By CARLETON STANLEY. Reprinted from the *University of Toronto Quarterly,* Vol. XIV, No. 4, July 1945. Pp. 409-413.

The Achievement of George Sidney Brett. By JOHN A. IRVING. Reprinted from the *University of Toronto Quarterly,* Vol. XIV, No. 4, July 1945. Pp. 329-365.

A History of Banking Theory. In Great Britain and the United States. By LLOYD W. MINTS. Chicago, Illinois, University of Chicago Press, 1945. Pp. 319.

The Liberal Tradition. A Study of the Social and Spiritual Conditions of Freedom. By WILLIAM AYLOTT ORTON. New Haven, Yale University Press, 1945. Pp. xiv, 317.

Man and Society: The Scottish Inquiry of the Eighteenth Century. By GLADYS BRYSON. Princeton, New Jersey, Princeton University Press, 1945. Pp. xii, 287.

Perplexities and Paradoxes. By MIGUEL UNAMUNO. Translated from the Spanish by STUART GROSS. New York, Philosophical Library, 1945. Pp. vi, 165.

Recent Trends in English Precedent. With a Comparative Introduction on the Civil Law. By JULIUS STONE. Sydney, Associated General Publications Pty. Ltd., 1945. Pp. vi, 76.

The Good and the Clever. The Founders' Memorial Lecture Girton College 1945. By A. D. LINDSAY. Cambridge at the University Press (The Macmillan Company, New York 11), 1945. Pp. 28.

A History of Western Philosophy. And Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day. By BERTRAND RUSSELL. New York, Simon and Schuster, 1945. Pp. xxiii, 895.

Alchemy as a way of salvation. By FREDERIC SPIEGELBERG. Stanford University, California, James Ladd Delkin, 1945. Pp. iv, 46.

Empirical Philosophies of Religion. By JAMES ALFRED MARTIN, JR. Morningside Heights, New York, King's Crown Press, 1945. Pp. xii, 146.

Le maeterlinckisme. Littérature, Science, Philosophie. Tome Premier, Tome Second. By MAURICE LECAT. Bruxelles, Anc^ne^ Librairie Castaigne, 1939. Pp. xv, 519.

NOTES

A PAPER on "Charles Sanders Peirce: America's Greatest Logician and Most Original Thinker" was delivered by Frederic H. Young before the Pike County Historical Society of Milford, Pennsylvania at a memorial meeting on October 15, 1945. The Society has undertaken to begin a collection of Peirceana for the Pike County Public Library, to establish a C. S. Peirce Scholarship Fund for students in the local academy, to inaugurate an annual Lectureship on Peirce's philosophy, and to found a Charles Peirce Memorial Society. Those interested in the Society should communicate with Reverend Frederic H. Young, Graduate College, Princeton University, Princeton, N.J.

A meeting of the Eastern Division of the American Philosophical Association will be held at Sarah Lawrence College, Bronxville, New York, from Thursday to Saturday, February 21 to 23, 1946.

There will be two periods devoted to concurrent sessions for unsolicited papers contributed by members of the Division on any philosophic problems in which they are interested. The program committee hopes that sufficient papers will be submitted on the general subject of *The Current Significance of the History of Thought* to justify a session on this topic.

THE FOLLOWING IS A LIST OF ARTICLES IN CURRENT PHILOSOPHICAL PERIODICALS:

THE JOURNAL OF PHILOSOPHY XLII 19: *S. S. S. Browne,* Right Acts and Moral Actions; *John Dewey, Sidney Hook, Ernest Nagel,* Are Naturalists Materialists? 20: *Harold H. Punke,* Vested Interests and Civilization; *Harold Taylor,* Democracy or Puritanism; *Carlton W. Berenda,* Notes on Cosmology. 21: *Abraham Edel,* The Evaluation of Ideals; *Donald Williams,* Realism. 22: *Raphael Demos,* Mr. Russell and Dogmatism. 23: *Ernest Nagel,* Some Reflections on the Use of Language in the Natural Sciences; *O. K. Bouwsma,* Mr. Murphy on Good-Will; *Arthur E. Murphy,* Good-Will and Good Judgment.

PHILOSOPHY AND PHENOMENOLOGICAL RESEARCH VI 1: *Marvin Farber,* Remarks about the Phenomenological Program; A Symposium on Probability, Part II: *Henry Margenau,* On the Frequency Theory of Probability—*Gustav Bergmann,* Frequencies, Probabilities, and Positivism—*R. V. Mises,* Comments on Donald Williams' Paper—*Felix Kaufmann,* Scientific Procedure and Probability—*Donald Williams,* The Challenging Situation in the Philosophy of

Probability; *Wendell Bristow Smith,* Ethics and the Aesthetic: An Essay on Value; *James Collins,* The Neo-Scholastic Critique of Nicolai Hartmann.

THE JOURNAL OF SYMBOLIC LOGIC X 2: *Olaf Helmer* and *Paul Oppenheim,* A syntactical definition of probability and of degree of confirmation.

PHILOSOPHY OF SCIENCE XII 3: *C. W. Churchman,* Probability Theory. I. Background; *C. W. Churchman,* Probability Theory. II. Postulates of Experimental Method; *C. W. Churchman,* Probability Theory. III. Non-Mechanical Concepts; *Guido Beck,* Mathematical Formalism and the Physical Picture; *Edgar J. Witzemann,* Chemistry and Evolution; *J. Lee Kavanau,* A Theory of Causal Factors in the Origin of Life; *James Feibleman,* The Hypothesis of Esthetic Measure.

SOCIAL RESEARCH XII 3: *John Collier,* United States Indian Administration as a Laboratory of Ethnic Relations; *Hans Rothfels,* Russia and Central Europe; *Fritz Sternberg,* Japan's Economic Imperialism; *Gerhard Colm,* From Estimates of National Income to Projections of the Nation's Budget; *D. J. Morgan,* Commentary on "Great Britain's Trade Policy" (Note); *Richard Schüller,* Rejoinder (Note).

THE ANTIOCH REVIEW V 3: *Donald Montgomery,* Reconversion to What?; *Emile Benoit-Smullyan,* Full Employment: Its Economic and Legal Aspects; *Jane Greverus* and *John Perry,* A plan for Work Security; *Walter P. Ruther,* Let's Use the War Plants; *Norma Bixler,* Married Women Workers in the War; *T. Swann Harding,* People are Just as Dumb as Anybody; *Jay Franklin,* World Security Today; *Horace S. Fries,* Scientific Mediation—Tool or Democracy; *Charles A. Madison,* Daniel DeLeon: Apostle of Socialism; *Sidney Hook,* Education for Vocation; *Alexander Morrow,* Patent Pools; *Sholom J. Kahn,* Henri Bergson's Method; *The Editors,* We Note.

THE PERSONALIST XXVI 4: *The Editor,* "Two Sparrows for a Farthing"; *John Richard Moreland.* "We Hid, as it Were, Our Faces from Him"; *P. Romanell,* The Ways of Peace and War; *The late John Wright Buckham,* Contrapletion: The Values of Synthetic Dialectic; *Marvin Wilson Green,* A Theory of Evil in the Tension Ethics of Reinhold Niebur; *Joseph Remenyi,* Sincerity in Literature; *Tom H. Tuttle,* The Philosophy of the Curriculum; *James McBride Dabbs,* "A Little Lifting Up of the Heart"; *Jacques Marquette,* Buddhist Mysticism.

THOUGHT XX 78: *J. J. Reilly,* The Present Significance of Newman; *Robert Hartnett,* Democracy in America; W. Eugene Shiels, A Padre Visits South America; *Ross Hoffman,* Peacemaking after Ideological Wars; *Alfons A. Nehring,* The Re-education of Germany; *N. S. Timasheff,* Russian Nationalism Under the Soviets; *Thomas F. Doyle,* Protestants in Mexico; *A. C. Pegis,* Cosmogony and Knowledge III: Between Thought and Being; *Theodore Maynard,* Coventry Patmore's Doctrine of Love; *Geoffrey Johnson.* Rediscovery.

THE JOURNAL OF AESTHETICS AND ART CRITICISM IV 1: *Editor's Comment,* The Journal under New Management; *Norman Cazden,* Musical Consonance

and Dissonance; *Paul Zucker,* The Aesthetics of Space in Architecture, Sculpture, and City Planning; *Helmut Hungerland,* Problems of Descriptive Analysis in the Visual Arts; *Van Meter Ames,* Note on A History of Esthetics; *Joseph T. Shipley,* Can We have an International Dance?; *Thomas Munro,* Society and Solitude in Aesthetics; *Prudence Myer,* Index of Previous Issues.

THE REVIEW OF POLITICS VII 4: *Peter Masten Dunne,* Church and State in Argentina; *Hans Kohn,* Treitschke: National Prophet; *Hannah Arendt,* Imperialism, Nationalism, Chauvinism; *Aaron I. Abell,* The Reception of Leo XIII's Labor Encyclical in America, 1891-1919; *L. H. Tibesar,* Hirohito—Man, Emperor, "Divinity"; *Edward A. Shils,* Britain and the World.

THE HIBBERT JOURNAL XLIV 1: *L. P. Jacks,* Food for Thought; *Ray Knight,* The New Lamps and the Old; The late *P. E. Richards,* The Supramundane; *Charles Hartshorne,* A New Philosophic Conception of the Universe; *Arthur Geddes,* Creation; *F. H. Heinemann,* A New Continent; *G. Leibholz,* Two Types of Democracy; *Hilda Oakeley,* The Redemption of International Relations; *C. J. Wright,* Faith and Catastrophic Victory; *H. Bompas Smith,* What is Religious Knowledge?; *Arthur E. Bell,* A Science Teacher Looks at Divinity; *C. J. Stranks,* Sydney Smith and the Religion of Common Sense; *Eva Martin,* Victor Hugo: Poet, Patriot, Philosopher (1802-1885); *Henry E. Bannard,* Some English Sites of Ancient Heathen Worship; *S. H. Mellone,* Survey of Recent Philosophical and Theological Literature.

FRANCISCAN STUDIES XXVI 3: Harry B. Gutman, The Rebirth of the Fine Arts and Franciscan Thought; *Gaudens E. Mohan,* The Prologue to Ockham's Exposition of the Physics of Aristotle; *Roger J. Bartman,* Cornelius Musso, Tridentine Theologian and Orator; *John M. Lenhart,* Who Kept the Franciscan Recollects Out of Canada?; *Ernest A. Moody,* Professor Pegis and Historical Philosophy; *Philotheus Boehner,* The Nature and Origin of Scientism.

JOURNAL OF THE HISTORY OF IDEAS VI 4: *Hans Kohn,* Dostoevsky's Nationalism; *Herbert Weisinger,* Ideas of History During the Renaissance; *Donald Lach,* Leibniz and China; *David Baumgardt,* Bentham's "Censorial" Method; *B. Moore, Jr.,* Some Readjustments in Communist Theory.

THE JOURNAL OF RELIGION XXV 4: *William A. Irwin,* The Reviving Theology of the Old Testament; *Edgar M. Carlson,* The Theology of Luther According to Swedish Research; *Dorothy M. Emmet,* The Letters of Franz Rosenzweig and Eugen Rosenstock-Huessy; *John C. Bennett, Bernard M. Loomer, Conrad Bergendoff,* Ecumenical Theology: Comments on Professor Pauck's Paper.

THE REVIEW OF RELIGION X 1: *Kurt von Fritz,* Greek Prayers; *Irwin Edman,* World Vision for World Order; *H. Heath Bawden,* Rainbow Round My Shoulder: A Review Article.

THE NEW SCHOLASTICISM XIX 4: *Ignatius Smith,* St. Thomas Aquinas and Human Social Life; *Anton-Hermann Chroust,* The Metaphysics of Time and History in Early Christian Thought; *Miriam Theresa Rooney,* Fifty Years Ago.

ANGLICAN THEOLOGICAL REVIEW XXVII 4: *Angus Dun,* The Social Responsibility of the Christian and of the Church; *Edgar J. Goodspeed,* The Didache, Barnabas, and the Doctrina; *J. Spencer Kennard, Jr.,* Syrian Coin Hoards and the Tribute Question; *Frederick C. Grant,* Early Christian Baptism; *Reuel L. Howe,* Personal and Social Implications of Baptism; *John S. Higgins,* The Anglican Communion Today (Church Congress Syllabus 40); *Francis Wright Beare,* The Teaching of First Peter.

SPECULUM XX 5: *B. J. Whiting,* The Vows of the Heron; *C. E. Odegaard,* The Concept of Royal Power in Carolingian Oaths of Fidelity; *Leonard Ellinwood,* Ars Musica; *G. R. Stephens,* The Early Life of Joan Makepeace; *Robert C. Cosbey,* The Mak Story and its Folklores Analogues; *F. E. Engreen,* Pope John the Eighth and the Arabs; *Peter Charanis,* The Phonikon and Other Byzantine Taxes; *Henry S. Lucas,* John Crabbe, Flemish Pirate, Merchant and Adventurer.

THE BRITISH JOURNAL OF PSYCHOLOGY XXXV 3: *K. F. Walker, R. G. Staines,* and *J. C. Kenna,* The influence of scoring methods upon score in motor perseveration tests; *E. A. Peel,* On identifying aesthetic types; *H. J. Eysenck,* Graphological analysis and psychiatry: an experimental study; *H. Banister* and M. Ravden, *The environment and the child.* XXXVI 1: *Charles S. Myers,* The Comparative study of instincts; *E. L. Thorndike,* On Orr's hypotheses concerning the front and back vowels; *Duncan Howie,* Aspects of personality in the classroom: a study of ratings on personal qualities for a group of schoolboys; *Graham Foulds,* Frustration types among mental defective juvenile delinquents; *J. A. Waits,* An inquiry into the attitudes of adults towards property in a Lancashire urban area.

PSYCHOLOGICAL REVIEW LII 5: *The Editor,* Introduction; *Edwin G. Boring,* The Use of Operational Definitions in Science; *P. W. Bridgman,* Some General Principles of Operational Analysis; *Herbert Feigl,* Operationism and Scientific Method; *Harold E. Israel,* Two Difficulties in Operational Thinking; *Carroll C. Pratt,* Operationism in Psychology; *B. F. Skinner,* The Operational Analysis of Psychological Terms; *Edwin G. Boring, P. W. Bridgman, Herbert Feigl, Carroll C. Pratt, B. F. Skinner,* Rejoinders and Second Thoughts.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY XXXV 5: *D. O. Hebb* and *Esme N. Foord,* Errors of Visual Recognition and the Nature of the Trace; *N. R. F. Maier,* Reasoning in Humans. III. The Mechanisms of Equivalent Stimuli and of Reasoning; *E. McGinnies* and *H. Schlosberg,* The Effects of Electroshock Convulsions on Double Alternation Lever-Pressing in the White Rat; *P. Eisenberg* and *H. A. Chinn,* Tonal Range and Volume Level Preferences of Broadcast Listeners; *D. A. Grant,* A Sensitized Eyelid Reaction Related to the Conditioned Eyelid Response; *G. S. Snoddy,* Evidence for a Universal Shock Factor in Learning; *M. A. Tinker,* Reliability of Blinking Frequency Employed as a Measure of Readability; *L. D. Goodfellow,* Artifacts in the Investigation of Sensitivity to Vibration.

PSYCHOLOGICAL BULLETIN XLII 9: *Seymour G. Klebanoff,* Psychological Changes in Organic Brain Lesions and Ablations; *Karl F. Heiser,* Certification

of Psychologists in Connecticut; Notice, Business Meeting of the American Psychological Association, Columbus, Ohio, December 27-29, 1945; *Various Authors,* Psychology and the War.

PSYCHOLOGICAL BULLETIN XLII 8: *Morris S. Viteles,* The Aircraft Pilot: 5 Years of Research, A Summary of Outcomes; *Theodora M. Abel,* Proceedings of the Sixteenth Annual Meeting of the Eastern Psychological Association; *Ralph H. Gundlach,* Proceedings of the Twenty-Fifth Annual Meetings of the Western Psychological Association; *Various Authors,* Psychology and the War.

THE MAHA-BODHI LIII 1-2: *A. Christina Albers,* In a Valley; *Madame Alexandra David Neel,* Buddhist Teaching; *P. S. Lakshiminarasu,* How to Overcome Impurities; *D. T. Devendra,* Buddhism and the Sinhalese; *Samanera Karuna,* Buddhism in Thailand; *Devapriya Valisinha,* Diary Leaves of the Late Ven. Angarika Dharmapala. 3-4: *Ishwara Topa,* Asoka as an Interpreter of the Buddhist Culture; *Bhikkhu Pannasiri,* The Sinhalese Nation.